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Journal

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Adventures Among the Islands of Langerhans

RUSSELL M. WILDER, Ph.D., M.D., M.A.C.P.
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AMONG THE foremost of the many outstanding achievements of this century was the discovery in Toronto, by Banting and Best, of insulin. The trail that led to this accomplishment was long and baffling. It began several centuries before the Christian era, perhaps in Egypt, more certainly in India. In India, *"madhu-mela"* (honey urine) was the name given to the disease that later, in Europe, came to be known as "diabetes mellitus." The name indicates that the sweetness of the urine, which is typical of the disease, was recognized; moreover, the characteristic symptoms—thirst, voracious appetite, polyuria, and languor—were ascribed to the disease (1).

The West lagged far behind these ancient Hindus in clearly recognizing diabetes. The Roman physician, Celsus, and the Greek, Aretaeus of Cappadocia, writing about the time of Nero, described the symptoms of the disease, and the latter used the term, "diabetes." Many centuries were to pass, however, before the Englishman, Thomas Willis, in 1670 could note the sweet taste of the urine and before Mathew Dobson in 1776 could ascribe the sweetness to sugar, thus permitting Johann Peter Frank (1745-1821) to add the word, "mellitus," to "diabetes."

Dr. Wilder, long pre-eminent among authorities on diabetes, made one of his last public appearances at the 42nd Annual Meeting of The American Dietetic Association in Los Angeles on August 27, 1959, when he presented the accompanying paper on the history of the treatment of diabetes. At the Annual Banquet of the Association that same night, he was made an honorary member of the Association, a recognition of which he was extremely proud. It is the editors' regret that this paper will represent one of his last contributions to the literature and to our profession. Dr. Wilder had long been an ardent supporter of dietetics, and with his death, the profession has lost a long-standing friend and advocate.

Discovery of Pancreatic Diabetes

The earliest hint that failure of the pancreas might be the cause of diabetes mellitus came in 1683 when a Swiss physician, Johann Conrad Brunner, while studying the digestive glands of the intestine (among them "Brunner's glands," as they afterward were called), excised the pancreas of a dog and noted that thirst and polyuria subsequently developed. Significance, however, was not attached to this by Brunner or anybody else, until Joseph von Mering and Oskar Minkowski in 1889, in the famous Strassburg Clinic of Bernard Naunyn, reported that diabetes is induced by complete removal of the pancreas. This work was epoch-making.

Although he was the junior author of the 1889 report, Minkowski should receive the major credit for the contribution. Naunyn (2) had this to say about it: "Tremendous impetus was given to our experimentation on diabetes by the discovery of pancreatic diabetes. Some days before, Minkowski came to me to say that Mering had upheld the dogma, accepted since Claude Bernard, that animals could not survive complete resection of the pancreas. He, Minkowski, had maintained that with dogs it was possible. 'What was my opinion?' I said, 'Since you have been able to remove the liver, you also should succeed with extirpation of the pancreas and since geese withstand that, dogs should stand it even better.' A day later, in my laboratory, Minkowski performed his first pancreatic extirpation. Mering assisted and then departed on a trip. When he (Minkowski) visited the laboratory, the next day, he could inform me that the dog had developed severe diabetes with 5 per cent sugar. Incidentally, Mering, as long as he remained in Strassburg, never removed a pancreas by himself, nor ever attempted in the slightest degree to participate in the development of the discovery."

Here ends this long quotation from Naunyn. I myself was fortunate in being able to visit Minkowski in the later nineteen twenties and to obtain from him confirmation of Naunyn's account. A fuller explanation is contained in a letter of Minkowski, quoted recently by Houssay (3).

[1]The Mayo Foundation, Rochester, Minnesota, is a part of the Graduate School of the University of Minnesota.

Exploring Les Iles de Langerhans

In 1869, exactly twenty years before the discovery of pancreatic diabetes by Minkowski, Paul Langerhans, while a student of Rudolf Virchow in Berlin, called attention to certain groups of pancreatic cells which differ greatly in appearance from the much more abundant acinar cells. He called the former *Zellhaufen* (little groups of cells), but had no suggestion as to their significance. Others also noted these Zellhaufen, but, like Langerhans, passed them by, much as a navigator might who sights an archipelago which happens to come within his range of vision, noting the observation in the log, but not exploring further. Then Laguesse, observing them, went ashore, examined them more carefully[2] and named them after him who first reported seeing them, *les iles de Langerhans*.

Laguesse was a distinguished professor of histology at Lille, France. It probably was he who first attributed to these islands the role of a gland of internal secretion. A similar hypothesis, however, was held by several others, some preceding him and many following. Kühne and Lea in 1882 had called attention to the rich glomerular-like capillaries surrounding and penetrating the islands. Ssobolew had tied the pancreatic ducts and noted that although this maneuver resulted in destruction of the cells excreting pancreatic juice, the islands were less affected. Others, including Weichselbaum, Stengle, Ssobolew, and the American pathologist, Opie, commented later on the vacuolation (hydropic degeneration), atrophy, hyalinization, and other alterations of the islands found at necropsy in diabetic patients.

Then came the work of Robert Russell Bensley, whose Harvey lecture gave Banting the courage to go ahead with his experiments when everyone told him he would fail. Banting is quoted to this effect by one of Bensley's pupils, Lazarow (5). Bensley was a chemist as well as an anatomist, a father one might say, of histochemistry. Special methods, of his own devising, for staining pancreatic tissue led him to conclude without a doubt that the cells of the Islands of Langerhans represent an organ with structure and function independent of the rest of the pancreas.

Bensley was a dedicated man for whom the search for indisputable evidence was of supreme importance. He was at work on this research, to be published in his classic paper of 1911 and expounded more extensively in his Harvey lecture of 1915, when my adventurous nature led me, in 1908, in the direction of these islands. At the end of the first two years of medicine at the University of Chicago, my fellow student, Maurice Pincoffs—later to follow a distinguished career as Professor of Medicine in the University of Maryland—was assigned with me to the task of presenting, to the class of physiology, a review of the anatomy and physiology of the pancreas. Pincoffs took the anatomy and I the physiology, but we worked together and came up with two lectures which the salty old professor, A. J. Carlson, said were very good. Carlson was young then, but old to our still-youngish eyes.

Personal Explorations

This experience, reinforced by the near-by presence of Dr. Bensley, prompted the decision on the part of each of us to spend more time in the basic sciences before continuing to clinical studies. This led to our appointments to instructorships in the Department of Anatomy and thus, after a summer's tramp in the high Sierra, to very close exposure to Dr. Bensley, Professor and Head of that department.

Later, for me, came a year in the laboratory of the distinguished sugar chemist, John Ulrich Nef, a pioneer investigator of unsaturated carbon compounds. There I made the acquaintance of several of the possible intermediates in the breakdown in the body of the sugars. The exposure to Professor Nef was at the prompting of Dr. Rollin Turner Woodyatt, another dedicated man, whose investigations then were turning on the behavior of various derivatives of glucose when injected into diabetic animals and human beings. He hoped, you see, to by-pass that step in the breakdown of sugar in the body which apparently is obstructed when diabetes mellitus is present. Woodyatt had received his training in clinical investigation in the laboratories of the illustrious physician Friedrich von Müller of Munich and had one of the keenest minds in American medicine.

Also at Woodyatt's prompting, after an internship under him and Dr. Frank Billings and some months in Germany, I again, as resident in the Presbyterian Hospital at Chicago, became engaged with Woodyatt in studies of the sugars. The chemist, Dr. E. J. Witzmann, and an internist, Dr. W. D. Sansum, were then also working under his direction. Dr. Sansum later headed a diabetic clinic in Santa Barbara. Dr. Witzmann was preparing derivatives of glucose for trial in diabetic patients. Later, he and Woodyatt were among the first, if not the first in the United States, to prepare insulin of sufficient purity for use in diabetic patients.

We had no luck with any of the derivatives of glucose, but were adding basic knowledge to the general problem, and a collateral investigation of glucose tolerance was remunerative from the standpoint of research. It depended on perfectly timed intravenous injections made with a machine de-

[2]This simile should be credited to Dr. J. P. Hoet, Professor of Clinical Medicine, Louvain, Belgium (4).

signed by the boss himself. Also of some value was a study of the rate of utilization of the ketone bodies which are responsible for diabetic keto-acidosis.

Insulin Is Discovered!

Then came the entry of our country into World War I, which put me in the Army for two years. After that, in the fall of 1919, I was appointed to the staff of the Mayo Clinic. There, where I was in charge of the diabetic patients, I continued to do research on diabetes and keto-acidosis which I had started with Woodyatt. Suddenly, from Toronto in the fall of 1921, came the news, by word of mouth, of the discovery of insulin. What a strike that was! And how welcome the results: the end of the long trail and final proof at last of the importance of the part played in diabetes by the pancreatic islands!

A small group of physicians from the United States was called by Professor J. J. R. MacLeod to meet informally in Toronto with the discoverers of insulin, and with Drs. W. R. Campbell, A. A. Fletcher, and W. R. Graham of the Toronto General Hospital, who already were giving insulin to diabetic patients. Included were Dr. E. P. Joslin from Boston; Dr. Woodyatt from Chicago (who already had had some experience with the insulin prepared in his laboratory, following the Toronto procedure for its extraction); Dr. F. N. Allan, then from Morristown, New Jersey, and New York; Dr. J. R. Williams from Rochester, New York; and myself. At this meeting, plans were adopted whereby insulin, to be manufactured by Eli Lilly and Company, was to be distributed at first only to this group of specialists. It was held that the most reliable information could be gained by this means and that the least danger would be encountered during the time which must elapse before the difficult problems of large-scale production had been solved and a potent, stable, and standardized form of insulin could be marketed. This procedure was widely followed afterward by others facing the problem of introducing new biologic preparations.

The members of this committee were to study independently, but to publish their results jointly in a single issue of the *Journal of Metabolic Research*, of which Dr. Allan was the editor. My contribution was made with my Mayo Clinic colleagues Drs. W. M. Boothby, C. J. Barborka, H. D. Kitchen, and S. F. Adams. We confirmed the observations previously reported and could add some other data (6).

Identifying Spontaneous Hyperinsulinism

Among the early observations of Banting and his associates at Toronto, confirmed by the studies of this committee, was the hypoglycemia (low blood sugar level) induced when insulin is injected in excess of needs. Among the visitors to the Toronto laboratories, when the pioneer investigations were under way, was the late Seale Harris of Birmingham, Alabama. It seemed to Dr. Harris that the symptoms which developed when an excess of insulin had been given were not unlike those he had seen developing spontaneously in certain of his nondiabetic patients. Soon thereafter he began reporting low blood sugars in such patients and came to diagnose the symptom complex he observed in them as "spontaneous hyperinsulinism" — an excess of pancreatic (island) function.

Dr. Harris' conclusions were not acceptable to many, because hypoglycemia may result from several abnormalities in which the pancreas presumably is not involved at all, and to one of the early presidents of The American Dietetic Association should go some credit for discovering the first generally acknowledged instance of hyperinsulinism. That was Florence Smith, who was then heading dietetics at our St. Marys Hospital. The case in point was later credited by the pathologist, Shields Warren (7), as providing "a firm foundation for the new clinical entity hyperinsulinism—and final proof of the insulin origin of diabetes."

Clinical Proof of Hyperinsulinism

The patient in this case was seen by Miss Smith immediately after his admission. He was unconscious, but appeared to her to be in insulin shock. She straightway sent for me. I came at once and suspected, as she had, that the man had received an excessive dose of insulin. We drew blood. The value for sugar was very low (hypoglycemia), but before the analysis had been reported to us we had given sugar (glucose) intravenously and had observed the rapid restoration of the patient's consciousness. This dramatic response to intravenously injected glucose was one with which we had become familiar in our by-then large group of diabetic patients treated with insulin by injection.

However, the patient in this instance had received no insulin by injection. Further examination led to the suggestion that disease of the liver was accounting for this and earlier episodes of convulsions and unconsciousness. Finally, at my insistence and that of the patient, who was a surgeon, an exploratory operation was performed. A tumor of the pancreas was found. It was cancerous and already had spread to neighboring lymph nodes and the liver, so that it could not be removed. However, a portion of the cancer was removed and it appeared to be composed of island cells. The patient died a few weeks later and tissue then could be obtained in amounts sufficient to extract for insulin. Extracts of the metastatic cancer in the liver injected into rabbits provoked very low blood sugar levels and convulsions (8).

This experience alerted us and others to look for other instances of active island tumors and has led to the reporting of several hundred such cases. In many of these, the tumor has been benign, and removal of the lesion has been followed by complete relief—a cure.

However, in other cases the surgeon failed to find the tumor, and especially confusing was a larger number of instances of hypoglycemia in which the episodes of the same were associated with vasomotor and emotional instability. These were patients of the type described earlier by Harris, who now are frequently referred to as having "functional" or "neurogenic hypoglycemia." The patients in these cases frequently are uncomfortable. To Miss Smith, again, should go some credit for a method of treatment which was effective. This was dietetic. It consisted in limiting as much as possible the carbohydrate in the diet and replacing it with calories derived from protein and fat. A similar procedure later was proposed by others (9).

My last contribution to this subject was made in 1942. By then we had had records of many patients with hypoglycemia, who from the severity of the symptoms, almost certainly had active island tumors, but in whom, even after two or three surgical explorations, no tumor could be found. In an instance of this kind I advised complete removal of the pancreas. This was done; it caused very little digestive trouble subsequently, and the diabetes, which, of course, resulted, was readily controlled with insulin. Meticulous examination of the surgically removed pancreas disclosed a tumor, located in the head of the pancreas, adjacent to the duodenum, where it could not be detected at the time of operation (10, 11).

I can lay no claim to any great discovery, but I was a member of the crew in several of the ships engaged in exploration of the Islands of Langerhans, and I must admit to a degree of pleasure in recalling these adventures.

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The Importance of Writing Clearly

Clear and lucid writing as well as being a professional responsibility is also a matter of manners. A communication should be understandable to its recipient. Any written communication, be it a letter, memo, or article, that is not written well enough to be understood by its intended recipient indicates a lack of consideration, arrogance, and inefficiency on the part of its author. No matter how brilliant the thought or the discovery, if it cannot be communicated in writing, it may become lost.

In public health as elsewhere the solution to clear writing lies in training people to write properly. This should be the responsibility of all levels of the educational system, but as often happens in cases of divided responsibility, this function is neglected and a scientifically and socially well-trained semi-literate may enter the School of Public Health for his final educational fling.

Clear writing is a matter of discipline. If the School of Public Health will accept the challenge and impose this discipline, it is not too late. If not, there may never be another chance. If Harvard is to produce leaders, let them be leaders who can write clearly!—*From an editorial in Harvard Public Health Alumni Bulletin 16: 13 (June), 1959.*

Nutrition Research for the Space Traveler[1]

BEATRICE FINKELSTEIN

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NOW THAT MAN has found that rocket vehicles can fly in space, he will not be satisfied until he jumps on and rides. His first rides will be short, perhaps so short that no food will be needed. Later, he will ride for longer periods, perhaps for two or three days. For this venture, he will need food and water. Still later, he may take even longer voyages—voyages lasting from six to nine months. And eventually, he may travel in space for periods of years and possibly generations.

During the past ten years, the Departments of the Air Force and the Navy, at their respective research centers, have anticipated, envisioned, and studied many of the medical problems which will be encountered in space travel. In brief, this work pertains to: (a) the effects of the gravitational forces to which man will be subjected as he is launched into space and during his re-entry into the earth's atmosphere; (b) the effects of solar and cosmic radiation; (c) the physiologic requirements of man in a sealed cabin—here careful consideration has been given to oxygen requirements, carbon dioxide levels, temperature control, safe cabin pressures, removal of noxious gases, and noise control; (d) the effects of weightlessness on the perceptual processes; and (e) the effects on behavior produced by environmental conditions that will be encountered in space travel.

As a result of this research, a multitude of extrapolations and predictions have been made. These, unfortunately, have pertained only in small measure to the space traveler's nutrition. However, I must hasten to add, data obtained from this research and development have paved the way and made possible the recommendations for feeding which will be discussed later.

Operational Conditions

Let us first consider the operational conditions which will exist during initial flights of sufficient duration to require food. The astronaut will travel alone in a sealed cabin. For purposes of protection in the event of emergency, he will wear a full pressure suit assembly, including helmet and gloves (Figure 1). Forces involved in take-off, transformation to a state of weightlessness, heat, vibration, noise, exploration of the unknown, and a keen desire to return to earth with as much data as possible will subject our traveler to tremendous stresses, both physical and psychologic.

For such short trips, the astronaut will carry stored oxygen, water, and food. However, restricted body movement and limitations in weight, space, and power will prohibit food preparation and the use of food preparation equipment. Conditions will demand provision of concentrated and "ready to eat" foods which can be consumed cold. Cabin environment will permit easy access to the mouth for eating and drinking except during periods of launching into space and re-entry into the earth's atmosphere. Weightlessness, in conjunction with many necessary protective measures, will, however, make the handling and eating of food somewhat difficult and awkward. Eating from a plate with the usual utensils and drinking from a cup will be impossible.

How will the astronaut eat? What will he eat? When will he eat? These are practical problems. The answer to the first question is comparatively simple. Liquids and semisolid foods will be served from collapsible "squeeze" tubes, in lieu of the usual utensils. A pontube, fitted to the end of each tube, will be placed directly into the mouth and food will be transmitted by applying pressure to the tube (Figure 2). Solids in bite-size form will be removed by hand from a covered container and placed directly into the mouth.

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[1]Presented at the 42nd Annual Meeting of The American Dietetic Association in Los Angeles, on August 27, 1959.

[2]The author is most grateful to Lt. Col. Albert A. Taylor, USAF (VC), Chief, Biomedical Division, Directorate of Life Sciences, Headquarters Air Research and Development Command, for his keen interest in the preparation of this manuscript.

FIG. 1. *Full pressure suit assembly, which will be worn by spacemen*

From our limited knowledge to date, no real problems involving the mechanics of eating in a weightless state are anticipated (1). Actually, we are not in a position to judge man's ability to eat under prolonged conditions of weightlessness. The present state of the art does not permit simulation of weightlessness, or production of it for more than 45 seconds at a given time, which is hardly long enough to gather valid information concerning the mechanics of eating, ease of digestion and absorption, or nutritional requirements. In addition, when normal gravity is removed for short periods of time, tendencies toward disorientation, discomfort, nausea, and motion sickness have been reported (2). These conditions are conducive to aspiration of food into the lungs. Should this occur, deleterious effects may be minimized if the food is in a finely divided form, such as occurs in liquids.

With these views in mind, a liquid diet, high in protein, adequate but minimum in calories for an individual engaged in sedentary activity and adequate with respect to the other nutrients, was formulated. It was then evaluated for consumer acceptability and its physiologic and possible psychologic effects when consumed exclusively for a five-day test period (3). The results, as summarized below, indicate the suitability of such a diet.

The Test Diet

Fifteen military and civilian men ranging in age from twenty-one to twenty-nine years were recruited on a voluntary basis. Two daily menus, consisting entirely of liquids, were alternated (Table 1). Meals were served in the nutrition laboratory. Fruit juices and a commercially canned chocolate drink were made available for between-meal snacks. Throughout the test period, subjects performed their usual laboratory activities. Each day's meals provided approximately 2,500 calories and 100 gm. strained protein. The latter was obtained by the use of two protein supplements. One was combined with coffee and the other with a vegetable purée. Protein was also obtained from strained meats and a concentrated ice cream mix. Average actual food intake approximated 2,300 calories and 100 gm. protein.

FIG. 2. *Pontube and collapsible tube, which will be used by spacemen in feeding themselves*

Weight changes during the test period were insignificant. All subjects rated their physical condition as excellent or good at the beginning of the test and also at the end. Since weight changes were insignificant and the caloric intake adequate for the activity performed, the reported feeling of hunger may be attributed to the small bulk and volume of the diet. Both of these were less than consumed in the ordinary mixed diet. As the test progressed, the incidence of hunger diminished. Gastro-intestinal disturbances reported were minor in nature. No subject curtailed his food intake or was in any way incapacitated because of these disturbances. Inconsistent results were obtained relative to the gas-producing qualities of the diet. Thirty-three per cent of the subjects reported the occurrence of gas at one time or another during the test. However, only one subject reported its incidence for four of the five days of the test.

Psychologically, no adverse effects were noted. One subject indicated that he was irritable. However, his remarks were qualified by the statement that his workload, extremely heavy during the week of the test, may have been responsible for his feelings. Throughout the test period, the morale of the group was good. At its conclusion, several subjects indicated regret that it was over.

TABLE 1 Liquid test diets containing approximately 2,500 calories and 100 gm. protein

MENU A	MENU B
Breakfast	
Tomato juice	Orange juice
Coffee drink	Coffee drink
Mid-Morning Snack	
Apple juice	Pineapple juice
Noon Meal	
Chicken drink	Chicken bisque
Chocolate milk	Chocolate milk
Mid-Afternoon Snack	
Apricot nectar	Apple juice
Evening Meal	
Beef drink	Vegetable soup
Lemon drink	Lemon drink
Coffee drink	Coffee drink
Evening Snack	
Chocolate milk	Chocolate milk

A preference rating for each food at each meal was indicated on a nine-point hedonic scale. Examination of mean preference ratings revealed a need to classify foods into two groups: (a) those which are commercially available and familiar items and (b) those which were prepared in the laboratory and have new and unfamiliar tastes. Foods in the first group were well liked, whereas unfamiliar foods were initially disliked. However, as the test progressed and these foods became more familiar, preference ratings increased. This trend conforms to data obtained repeatedly by the food technologist. As you well know, poor acceptance was noted with the introduction of pasteurized milk, soluble coffee, frozen vegetables, and bakery mixes, yet today these foods enjoy high acceptability.

These data indicate the feasibility of using a high-protein liquid diet for initial space flights, should a diet of this consistency be required.

What Will the Foods Be?

Now let us turn to the second question: what will the astronaut eat? The answer to this question is much more difficult—not because of our abilities to supply food but because of the role that food plays in a situation of stress. This is evidenced by data obtained from isolation studies conducted at the Aerospace Medical Laboratory, Wright Air Development Division. In these tests, the subject is removed from his usual source of sensory input, i.e., sound and light. Study is made of his ability to adapt to this unusual situation.

Sensory deprivation is achieved by placing a subject in a dark, soundproof chamber. The chamber is furnished with a bed, chair, refrigerator, and chemical toilet (Figure 3). Study is centered on how the isolated individual reacts and the means he employs to defend himself against the effects of isolation. Prolonged periods in isolation are necessary to study these factors. Feeding becomes essential.

Foods are provided in advance. Those which can be distinguished by their own shapes, such as eggs or triangles of processed cheese, are wrapped in aluminum foil. Those which require packaging are put into plastic containers. Each food group is packaged in a differently shaped container. Within a specific group, the containers of different foods are coded with masking tape to facilitate identification (Figure 4). The subject is apprised of the code system before entering the chamber. He is also indoctrinated as to the arrangement and placement of food, both in and out of the refrigerator.

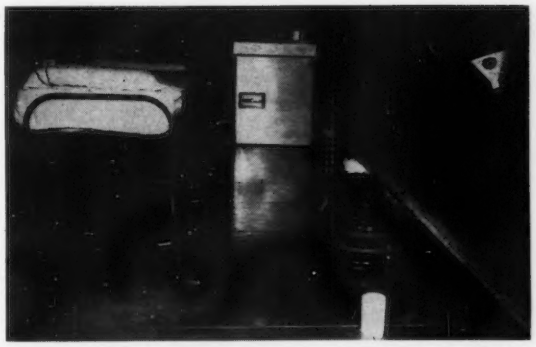

FIG. 3. *Equipment of isolation chamber for studying human reaction to sensory deprivation*

Dark-isolation trials already conducted have ranged from 6 to 168 hr., with some fifty persons participating. Food has had varying degrees of significance: some subjects have spent excessive amounts of time eating, nibbling, or counting food; others have become very angry with the food or very fond of it. Evidence is strong that food in a situation of stress may be used as a tool to obtain personal satisfactions.

Despite this psychologic tie with food, caloric intakes are within normal range for persons engaged in sedentary activity in an environment of comfortable temperature and humidity. Subjects consumed approximately 2800 calories per day. However, eating patterns have varied. Some subjects snack on food at frequent intervals, others maintain the customary three- to four-meal cycle per 24-hr. period. These differences may be attributed to the fact that the subject has no way of gauging the passage of time.

Palatability and acceptability of food in many instances have been contrary to those on the ground or in the air: e.g., brownies have enjoyed only a fair degree of acceptability, whereas ordinarily they are highly acceptable; canned orange juice usually rates low in acceptability, but in isolation, it has a moderate-to-high degree of acceptability. Data also indicate that the ability to discriminate one food from another in the same food group is impaired. All meats taste alike. Subjects are unable to distinguish one canned fruit from another. White, whole wheat, and rye breads in sandwiches are frequently considered similar in taste. Thus, it is apparent that the removal of the visual cues ordinarily associated

FIG. 4. *System of coding various foods used in isolation chamber*

with eating interferes with the taste and enjoyment of food and therefore its acceptability. Food acceptability varies greatly this stress situation.

High-Altitude Balloon Tests

Acceptability of food as related to stress has also been obtained from high-altitude balloon flights. The Air Force, in its endeavors to explore and anticipate the problems of manned satellite flight, has already performed a series of high-altitude balloon flights. These manned balloons, when flown at altitudes of approximately 100,000 ft., provide space-equivalent conditions. Hence, they serve as a test for the study of many physiologic and psychologic aspects of space flight (4).

Feeding programs for our balloon trials have been formulated with these criteria in mind:

(a) The balloonist will spend a minimum of 24 hr. in the air and approximately 48 hr. in the capsule.

(b) During flight, the subject's activity level will be extremely high and will be accompanied by considerable stress. Yet, peak efficiency must be maintained.

(c) The weight of food must be maintained at the lowest level compatible with good acceptability and adequate nutritional value.

(d) The storage space for food and accessory items will be limited.

(e) Weight and space limitations preclude the use of any food service equipment.

(e) The temperature range of the capsule will be 40° to 75°F. Humidity will average 50 per cent.

The food used in the last balloon trial is indicated in Table 2. These foods provided approximately 6,000 calories for a 48-hr. period.

Nutritional support for balloon flights has been satisfactorily accomplished. In each flight, food has assumed a significant emotional and social role (5). One subject indicated that candy and nuts were

TABLE 2 Inventory of food and accessory items in Manhigh III Balloon Trial

FOOD	UNIT	AMOUNT
Beverages		
Coffee drink*	8-oz. bottle	1
Milk, whole	8-oz. can	2
Chocolate drink	8-oz. can	2
Candy		
Chewing gum	package	1
Chocolate candy	2-oz. package	1
Cake, cookies, crackers		
Chocolate cookies	package of 5	1
Pound cake	1½-oz. carton	1
Crackers, soda	package of 5	1
Fruit and fruit juice		
Raisins	1½-oz. carton	1
Orange juice	5½-oz. can	3
Pineapple juice	6-oz. can	3
Meat		
Beef cubes	3-oz. package	3
Beef, semisolid	1½-oz. tube	2
Chicken, semisolid	3½-oz. tube	2
Nuts		
Assorted	5-oz. package	1

*A high protein beverage prepared with a protein supplement.

consumed during the descent portion of the flight. These were considered as a reward for a difficult job which was near completion. Another subject referred to pound cake as: "A very welcome sight. It appeared almost like a Christmas gift and gave me a lift in spirit." Thus these studies indicate the emotional and social significance of food during stress. Other investigations of the Aerospace Medical Laboratory (6) confirm this. It is, therefore, our desire to provide food which will alleviate rather than contribute to the stress of space flight.

When Will Astronauts Eat?

Let us think now in terms of our third question: when will the astronaut eat? Eating at 2- to 3-hr. intervals is considered necessary to insure, insofar as possible, an optimal state of nutrition at all times. It is likely that the stress inherent in space flight will markedly interfere with appetite. Changes in day-night cycling while orbiting, as well as adaptation to a state of weightlessness, will conceivably diminish the desire for food. Permitting the astronaut to regulate his intake according to personal desire for food and fluid may mean that an emergency can arise when the subject's state of hydration and nutrition are already inadequate. This occurred in one instance of extreme heat stress which arose suddenly and unexpectedly during a manned high-altitude balloon flight. Data from this experience suggest the need for frequent, scheduled consumption of food during all phases of unusually demanding missions.

Proposed Feeding Plan for Space Man

Recently, it was my privilege to propose a feeding plan to the National Aeronautics and Space Agency

FIG. 5. *Disposable mitten to be worn over gloved hand while eating*

for subjects participating in Project Mercury, a project designed to enable man to orbit the earth. This document includes plans for preflight and in-flight feeding and makes provision for essential accessory equipment.

Protective clothing to be worn during initial space flights precludes defecation. To cope with this problem, a high-protein, low-residue diet for 72 hr. prior to take-off has been formulated. This diet provides foods which are completely absorbed from the gastro-intestinal tract, thereby leaving little or no bulk for the formation of feces. Preflight feeding recommendations also provide for a high-carbohydrate, moderate-protein, low-fat meal immediately prior to take-off. A meal of this type is conducive to increased altitude tolerance.

Foods recommended for consumption while in flight consist of a variety of sandwiches; meat, such as beef, turkey, and ham; fruit sauces; fruit juices; chocolate drink; cookies; and candy. Solid foods will be in bite-size form, each bite individually wrapped; liquids and semisolids will be packaged in collapsible "squeeze" tubes. These foods will furnish approximately 2,000 calories per day with 49 per cent derived from carbohydrate, 16 per cent from protein, and 35 per cent from fat. For each day of flight, 3,000 ml. water will be provided. Consumption of a multivitamin preparation during flight is recommended, since experimental data indicate beneficial effects from water-soluble vitamins during stress.

For reasons of sanitation and maintenance of cleanliness of pressure gloves, a disposable mitten will be worn over the gloved hand while eating (Figure 5). These mittens of lightweight polyethylene are greaseproof and waterproof. Such mittens are deemed necessary to minimize the possible transfer of foreign particles to extremely delicate instruments. Should such transfer occur, efficiency of operation might be impaired.

The effectiveness of preflight feeding procedures will be determined in advance for each test subject. In addition, subjects will be afforded ample opportunity to become familiar with foods and packaging procedures recommended for in-flight use. Insofar as possible, the food likes and dislikes of each subject will be considered.

Formulation of the feeding program just discussed is based on knowledge of flight feeding requirements, the experience of crews who have flown high-altitude, high-performance aircraft, and those who have made high-altitude balloon flights, as well as a variety of laboratory studies (7). In spite of this wealth of information, plans for feeding in space have been designed with a lack of knowledge of the effects of weightlessness for prolonged periods of time as well as a very limited knowledge of the stresses produced by confinement in a sealed cockpit in the middle of nowhere. These are conditions which cannot be simulated on the ground. Certainty with respect to nutritional requirements and feeding needs will come only when man invades space and returns safely to earth.

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Feeding Problems in the Submarine Service[1]

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THE FEEDING problems inherent to living aboard a submarine have remained basically the same since a submarine was first developed which could remain at sea for more than a few days. The importance of these feeding problems, however, has increased steadily as submarine capabilities have improved.

Immediately prior to the development of the nuclear-powered submarine, the limiting factor in the time a submarine could remain at sea was the amount of diesel fuel it could carry. Depending on its size and operating speeds, a submarine could remain at sea for periods up to 100 days. With the successful development of nuclear-powered reactors and oxygen-generating equipment, the United States was able to build submarines which can remain at sea for as long as two years. Food has thus become the time-limiting factor in submarine operations.

Additionally, when one considers the many similarities in a submarine as compared with a manned space vehicle, it readily becomes apparent that the feeding problems on a submarine are very similar to those which can be anticipated in a space ship. Thus, any solution to the submarine feeding problems will be a step forward in the space-ship development program, and submarine feeding problems assume an even greater significance.

Basically, the feeding problems aboard a submarine can be divided into three categories: stowage, meal preparation, and dietary adequacy.

Stowage

In spite of the increased capabilities of nuclear submarines, the food stowage spaces have, of necessity, remained essentially the same size as those of World War II submarines. The situation has been further aggravated by an increase in the number of men needed to operate a nuclear submarine. To illustrate the problem with a few figures, the average submarine contains approximately 150 cu. ft. refrigerator space, 70 cu. ft. chill room space, and 150 cu. ft. dry stores space.

Since the space available for stowage has definite limits, it has become necessary to develop and use food concentrates and so called "ration-dense foods." Progress has been made in this direction as evidenced by such items as frozen juice concentrates, dehydrated potatoes, dry milk solids, powdered eggs, and so on. As rapidly as these food concentrates and ration-dense foods become available, they are used on submarines.

On a recent ninety-day cruise aboard the U.S.S. *Sargo*, one of our latest nuclear submarines, 50,000 lb. of stores were needed to maintain the crew of 102 officers and men. Since the refrigerator and chill room spaces were inadequate for the amount of fresh meat that would be needed, it was necessary to supplement the fresh meat with canned meats. The dry stores space was completely filled with food packaged in paper and cardboard containers.

The supply of fresh foods and vegetables, such as whole milk, fruit, eggs, lettuce, and so on, had to be severely limited, not only because they do not keep well for long periods but more importantly because they require much more stowage space than substitute processed foods. Food concentrates and ration-dense foods were substituted wherever possible. With all this careful planning and substitution, it was still necessary to use all available dead space around and behind machinery, equipment, torpedo tubes, and so on, throughout the ship to store canned goods.

Despite all these difficulties and inconveniences, the cruise was a complete success. It was obvious, however, that the ship could have remained at sea five to ten times as long insofar as the nuclear power

[1]Presented at the 42nd Annual Meeting of The American Dietetic Association in Los Angeles, on August 27, 1959. The opinions and assertions contained herein are those of the author and are not to be construed as reflecting the views of the Navy Department or the naval service at large.

Official U. S. Navy photo

Galley on U.S.S. Capelyn

plant was concerned, whereas it would have been impossible to carry sufficient food of the types presently available for a cruise more than twice as long.

Although more and more food concentrates and ration-dense foods are continually being developed and will be utilized to extend the operational capabilities of submarines, they too, will in time completely fill all the available stowage spaces. The ultimate goal is the establishment of a closed-cycle, ecologic system in which the carbon dioxide and nitrogenous wastes of man will be utilized by some form of plant life, probably algae, which in turn will produce oxygen and food to be utilized by man. A research project has been instituted to develop such a system. Once the system has been developed, dietitians and nutritionists will be needed to determine the adequacy of such a diet and to develop methods of preparation that will satisfy human tastes.

It is not anticipated that world conditions will be such that submarines will be required to stay on patrol indefinitely without returning to port to refurbish. Therefore, it is unlikely that the submarine service will ever need such a closed-cycle system. A submarine, however, would make an ideal field testing facility to prove the adequacy of such a system prior to its final installation in a manned space rocket. From my limited experience and observations with inter-service relationships, I feel certain the Navy would be more than willing to assist in this project.

Meal Preparation

The preparation of meals aboard a submarine has always been a difficult problem. Since it is necessary for men to be on watch at all times, the crew is arbitrarily divided into three watches with each standing the watch 4 hr. followed by 8 hr. off watch.

I do not wish to imply that the only time a man works is during his watch and that he therefore works two 4 hr. periods out of 24 hr. During his watch, the man remains constantly at his duty station, spending the entire time operating the specific equipment for which he is responsible. During his off-duty hours, he, in conjunction with the other members of the department, will carry on the normal maintenance, replacement, and repair of the equipment in their department. For example, the engineman on watch on a diesel submarine maintains his engines at the proper speed, constantly checking his lubricating oil pressure and temperature, cooling water temperature, fuel oil consumption, and so on. During his off-watch hours, he will perform engine maintenance and repairs, such as removing and replacing worn cylinder liners, cracked cylinder heads, malfunctioning fuel injectors, and so on, as needed.

With a three-section watch cycle and a normal three-meal-a-day schedule, one section will eat a given meal immediately prior to going on watch, another section will eat the same meal immediately after coming off watch, and the third section must eat the same meal at the mid-point of their off-watch period.

Using breakfast as an example, men on the oncoming watch eat at 7:30 A.M. immediately prior to going on watch at 8 A.M. The off-going watch section eats breakfast from 8 to 8:30 A.M. Meanwhile, the third section, which came off watch at 4 A.M., must get up to eat breakfast and can then retire again or, as is more usual, begin routine maintenance and repair work.

This situation exists at all meals, with the oncoming watch eating first and the off-going watch eating last. As a result, breakfast is not always the first meal of the working day for each section, nor is dinner the last. Furthermore, each section has its 8-hr. off-watch period split in half for one meal or another.

In the past, several attempts have been made to alleviate this situation by re-adjusting watch periods and rearranging the meal schedule so that all sections could get breakfast prior to assuming their first watch of the day, lunch at approximately the mid-portion, and dinner on completion of the working day (1). No matter how this schedule is adjusted, it is necessary to prepare nine different

Official U. S. Navy photo

Part of the crew eating their evening meal aboard the U.S.S. Skate

Official U. S. Navy photo

Mealtime aboard the U.S.S. Nautilus

meals a day and, on occasion, it is necessary to have two different meals within an hour or so of each other—a situation which is impossible in the limited galley space available on a submarine.

To alleviate this situation as much as possible, breakfast is served from 7 to 8:30 A.M., lunch from 11:30 A.M. to 1 P.M., and dinner from 7:30 to 8:30 P.M. In addition, there will be a snack consisting of hot soup and sandwiches at 3:30 to 4:30 P.M. and 11:30 P.M. to 1:30 A.M. Thus, all watch sections have the opportunity to eat three meals a day with minimum disruption of their sleep.

In general and whenever possible, most of the maintenance and repair work is done during the day, thus leaving the ship in relative quiet at night so that men getting off watch at 8 P.M. and at midnight can have approximately 7 to 8 hr. uninterrupted rest whenever possible. Practically, however, the men usually get two 3- to 4-hr. naps each day during their off-watch periods.

A second problem in meal preparation on a submarine results from the lack of stability of the ship. During normal transits from one port to another at depths greater than 100 ft., a submarine is much more stable than a surface ship and has none of the pitch and roll caused by wave motion. However, a submarine dives, surfaces, and changes depth at angles up to 25 degrees and can, when the need arises, exceed 45 degrees.

To visualize this situation, at a 25-degree angle, dishes and silverware slide off the tables; books, ash trays, ink bottles, and anything else lying loose slide off desks; chairs slide across the floors, drawers open, if not latched; and the galley (if not forewarned) rapidly degenerates into a shambles. This situation, in addition to disrupting the preparation of meals, is quite often hazardous not only to the cooks but to people in contiguous compartments.

Steps have been taken to improve this situation by using well-type deep-fat fryers, various types of holding brackets, and so on, but a great deal more needs to be done.

Diet

In spite of the stowage and food preparation problems, the submarine service has been able to maintain good, well balanced diets for submariners as compared with contemporary standards. Submarine crews have suffered from lack of food only when, in an exceptional situation during World War II, a submarine was forced to remain at sea longer than anticipated; had suffered a loss of food due to spoilage resulting from damage to the submarine from enemy action; or, on one occasion since World War II, when a battery explosion and fire resulted in the loss of some stores.

The submarine service has a basic subsistence allowance of $1.37 per man per day, which is 12 cents a day more than any other branch of the naval service, with the exception of naval hospitals. This additional allowance is necessary for the purchase of food concentrates and ration-dense foods which are more expensive than regular foods.

The cooks and bakers receive approximately six months' basic schooling in techniques of preparing food, principles of sanitation, and the importance of nutrition. From time to time, they are sent to advanced schools to further their education and training in food handling and preparation.

The submarine service continuously utilizes the master diet plans issued to the Armed Forces from Washington. These master diet plans are published with the guidance and at the recommendation of civilian consultant dietitians. Furthermore, the weekly menu is submitted to the responsible medical officer and is subject to his approval in regard to nutritional value.

Many psychiatrists, psychologists, and dietitians had expected submariners to become overweight. It was felt that overeating would occur as a mechanism to alleviate boredom and satisfy oral aggressive needs and that this, coupled with lack of exercise, would result in obesity. This is not supported by the clinical observations and studies made by doctors in the submarine service. In fact, it has generally been noted that the usual submariner maintains the same weight at sea that he normally maintains at home and that many of the obviously overweight submariners actually diet and lose weight during long submarine patrols while they are away from the influence of their wives and families and the eating opportunities afforded while watching television.

Several dietary studies on submariners have been made (1-3), and it has been found that the average submariner eats a diet of 3000 to 3500 calories per day consisting of 100 to 120 gm. protein, 400 to 480 gm. carbohydrate, and 100 to 120 gm. fat and containing more than the established minimum adult daily allowances of thiamine, riboflavin, ascorbic acid, and vitamins A and D.

The variation in caloric requirements existing in submariners is not due to any appreciable differences in the amount of physical labor they perform. Rather it depends on the location of the submarine's operating area. Submarine crews operating in Arctic and Antarctic waters require as much as 800 calories per man per day more than similar crews operating in tropical and subtropical oceans and seas.

During my ten years' service with the submarine force, I have not seen personally nor heard from any of my colleagues of a single case of clinical vitamin deficiency nor of a suspected subclinical case which was proved by laboratory tests.

Summary

To summarize, the food carrying capacity is the greatest of the feeding problems in the submarine service. It has become a limiting factor in submarine operations. Through the continuing research of dietitians, the variety and amount of concentrated, dehydrated, powdered, and other forms of ration-dense foods are steadily increasing, thereby extending the limits of submarine operations.

The submarine service has maintained a good, well balanced diet for our submarine crews in the past. We can continue to do so as long as we maintain our present relationships with and continue to utilize the information obtained from the research and developments accomplished by dietitians and their parent organization, The American Dietetic Association.

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Research Project on Phenylketonuria

New York State for the first time will go into the community to provide for a treatment for the prevention of mental deficiency resulting from phenylketonuria, or phenylpyruvic acid deficiency, according to a recent announcement by Dr. Paul H. Hoch, Commissioner of Mental Hygiene. The treatment consists of a special dietary formula which will be supplied by the Department of Mental Hygiene for children up to the age of five suffering from the disease who are expected to respond to the treatment.

The program is being organized on a research basis and will enable physicians to obtain supplies of the necessary diet for patients if their financial circumstances are such that they require assistance. It is estimated that twenty new cases of this rare form of mental deficiency occur each year in New York State.

While irreversible brain damage occurs within the first five years of life in the absence of treatment, there is good reason to believe that a child identified in early infancy and treated with the special diet will not become mentally defective. Phenylketonuria is caused by the failure of one of the body's enzymes to assimilate phenylalanine. Use of a purified, low-phenylalanine diet, from which the offending substance has been removed, helps to prevent or minimize the disorder if treatment is begun before brain damage occurs. A comparatively simple ferric-chloride diaper test now offers an effective technique for mass screening and detection.

The operation of the pilot program, believed to be the first state project of its kind in the country, will be centered at Letchworth Village, Thiells, New York, under the direction of Dr. George A. Jervis, Director of Psychiatric Research and a pioneer in this field of mental deficiency.

Analysis of Nine and a Half Years' Experience

Treatment of Multiple Sclerosis with a Low-Fat Diet[1]

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OUR EXPERIENCE over nine and a half years with a low-fat diet in the treatment of multiple sclerosis is analyzed in this paper. Although progress reports of this study have already been made (1-3), our data are subjected to a more detailed analysis in this report.

Material and Methods

The patients in this study have been from the Montreal area. We have been able to follow continuously 153 patients, from whom dietary histories have been obtained. Thirty-two of these patients have followed the dietary prescription poorly, and our data on them are incomplete. These have been excluded from the analysis. Thus, data from 121 patients are included in this final analysis.

The low-fat diet has remained unchanged except for minor alterations in the prescribed amounts and types of the lipid intake. During the first year of the study, from December 1948 to approximately December 1949, the diet contained 20 to 30 gm. fat, mostly milk and animal fat. During the next two years, the animal and milk fats were limited to 20 gm. daily. To this were added 5 gm. cod-liver oil and 10 to 15 gm. vegetable oil daily. In December 1951, the milk fat was eliminated, and the animal fat, including hydrogenated vegetable oils such as shortening and margarine, was reduced to 15 gm. a day. Fifteen gm. vegetable oil (corn oil, cottonseed oil, olive oil, soya bean oil, and safflower oil) and 5 gm. cod-liver oil were retained in the diet. The protein intake has been maintained at 50 to 60 gm. or more daily, depending on the weight and dietary habits of the patients. The balance of the caloric need has been obtained from carbohydrates. In general, our patients lose weight when first placed on diet and stabilize their weights at 5 to 10 per cent under what is considered normal average weight. One multiple vitamin capsule, containing vitamins A, B complex, D, and ascorbic acid, is taken daily, and whole wheat bread is recommended. Skim milk or buttermilk is used by all patients as a source of protein. Most patients eat at least one egg daily.

The small amounts of "invisible" fat contained in bread and many other foods have not been accounted for in our diet. It is estimated that the average patient consumes from 5 to 10 gm. fat from these sources daily. Therefore, the actual intake of animal or hard fats is probably 20 to 25 gm. daily. Little correction need be made for the oil intake.

The dietary intake of the patients is checked every two weeks at first, and later at monthly intervals. The patient records all the food he eats for each meal. This is checked by the dietitian and necessary adjustments are made. The patient is weighed at each visit so changes in weight can be avoided. The diet and many recipes substituting vegetable oils for animal and butterfats have been assembled and published (4). This detailed guide is followed by the patients.

We maintained continuous direct contact with the patients in Montreal from December 1948 through April 1954. Since then, we have been in contact with them by mail from Portland, Oregon every six weeks to three months, and have interviewed and examined them once a year in Montreal in the month of June. The patients continue to keep careful records of their diet, weight, and physical condition, and these records are sent to us periodically.

[1]Supported by a yearly grant from the Multiple Sclerosis Society, Portland, Oregon, and supplemented through June 1958 by the Montreal Neurological Institute. Presented at the 42nd Annual Meeting of The American Dietetic Association in Los Angeles, on August 26, 1959.

There has been no change during the nine-and-a-half-year period in the control of the subjects. The same observer (R.L.S.) has seen them and evaluated their neurologic and physical state through the entire study. Except for approximately the first six months, the same person[2] has checked the patients' diets. The methods of interview and evaluation have been the same throughout, and since June 1954, the subjects have remained the same. Since June 1954, the data have been kept in tabular form for analysis.

Results

Two clinical features of multiple sclerosis are available as indicators of progress in this disease. First, one can compare the *frequency and severity* of "attacks" before and after treatment; second, one can observe the *performance of patients* prior to and while on treatment. Either or both of these criteria can be used successfully, if correctly evaluated over a long enough period, and in a large group of patients.

The "attacks" are composed of an exacerbation followed by a remission (see figure on page 815 in another paper [3]). Early in the disease, remissions may be quite complete, and between "attacks," the condition of the patients either continues to improve or remains unchanged. As the disease progresses, the remissions are less complete, and between "attacks," the condition of the patients gradually deteriorates. This important point differentiates the *early phase* of the disease from the *late phase*. Because of the slow progress of the disease, it is often difficult to categorize patients when they are first seen. These uncertain cases have been grouped together and are referred to as in the *intermediate phase*. In this report, only the exacerbating-remitting cases of multiple sclerosis are considered; the few cases which have been slowly progressive from onset have been eliminated.

THE FREQUENCY AND SEVERITY OF "ATTACKS"

The frequency and severity of "attacks" were carefully studied in our first forty-seven cases. In each patient, the history prior to treatment by diet was inquired into on at least two occasions. The patient was then instructed to record his own history with help of friends or family. Finally, hospital and out-patient records were examined. From these accumulated data, the frequency of attacks during the three-year period prior to treatment was determined. During treatment, *all* subjects were seen at regular intervals, and the attacks were recorded.

We have observed that exacerbations are more frequent in active than in inactive patients. Also, exacerbations are easier to recognize and evaluate in active patients. For this reason, in our initial studies, the thirty-four early- and intermediate-phase patients were most intensively studied relative to exacerbations of disease. These patients were all ambulant, and many were working full time. From this group, we established our pre-diet attack rate at 1.1 exacerbations per patient-year if all exacerbations in the three-year period before dietary treatment was begun were included, and 0.9 exacerbations per patient year if the year immediately preceding treatment, as suggested by Compston (5), was excluded.

The effect of the low-fat diet on the relapse or exacerbation rate is shown in Figure 1. All 121 of the treated cases are included in this graph. They are divided into those placed on the low-fat diet from 1948 through 1951 and those placed on the diet from the beginning of 1952 through 1954. The solid line in the figure reflects the average of all cases in the study. In both groups, a significant decrease in exacerbation rate occurred, but the decrease was perhaps greater in the 1952-54 group. You will recall that beginning in 1952, butterfat was eliminated from the diet, the animal fat was reduced to 15 gm., and vegetable oil to 15 gm. Cod-liver oil, 5 gm. per day, was retained.

It has been pointed out before (1-3) that the severity of exacerbations as well as frequency, decreases on this low-fat diet. Severe exacerbations have not occurred in this group of patients on the low-fat diet after they have followed it for more than one year.

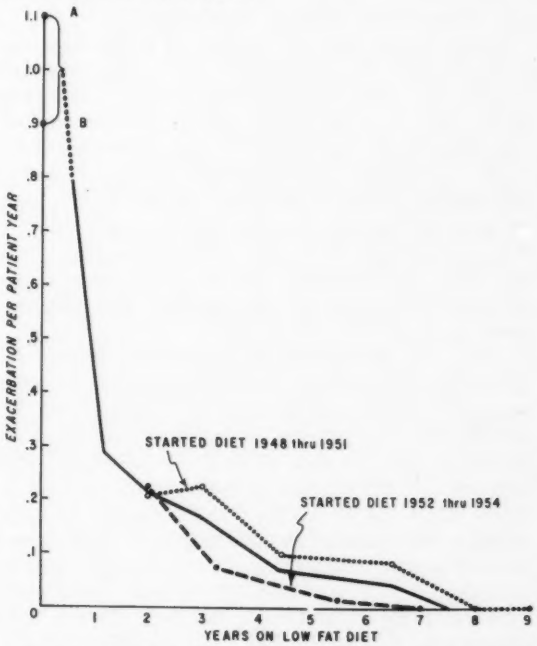

FIG. 1. *Exacerbation rates for 121 patients with multiple sclerosis, before and during treatment with low-fat diets.*

[2]Aagot Grimsgaard

The exacerbations per patient year before and while on the low-fat diet were also related to the duration of multiple sclerosis. In agreement with Thygesen (6), there was no tendency for the exacerbation rate to decrease with time in untreated patients during the first eight to ten years of disease. On the other hand, *while on the low-fat diet,* a decrease in exacerbation rate from approximately 1.1 per patient year to 0.15 per patient year occurred. This decrease was obviously not due to the duration of the disease.

EVALUATION OF NEUROLOGIC STATUS AND PERFORMANCE

The progress of multiple sclerosis in patients on the low-fat diet is significantly influenced by the phase of disease (early, intermediate, or late) during which the diet is instituted. To demonstrate this, the following categories for performance and neurologic status were established in the spring of 1954.

0–the patient is normal neurologically and his performance in life situations is likewise normal.
1–his physical and mental performance is normal, but abnormal neurologic signs are present.
2–his performance is impaired slightly to moderately, and abnormal neurological signs are present. He works part time or is actively ambulant.
3–his performance is severely impaired, but he is still ambulant. He is unable to work.
4–the patient is confined to wheelchair or bed.
5–the patient dies. At the present writing, one patient in our group of 153 is dead.

The average category of our 56 *early-phase patients* improved significantly during their six and a half years on low-fat diet. The average category before diet was 1.6; at the end of study period, it was about 0.85. The 25 *intermediate-phase cases* remained unchanged in the category of approximately 2.0. The 40 *late-phase cases* deteriorated slowly from an average category of about 2.5 to approximately 3.0 over a period of six and a half years on the low-fat diet. The average age of onset of multiple sclerosis in the three groups was 27.8, 26.3, and 28.2 years respectively.

When the percentage of patients showing *no* deterioration was plotted against the interval between onset of multiple sclerosis and the initiation of the low-fat diet, an interesting fact emerged. Patients placed on the diet soon after the onset of multiple sclerosis did better than patients placed on the diet later. Those placed on the diet during the first six months after diagnosis did extremely well; none showed deterioration. There were twenty patients in this group. Their diagnosis may be questioned because of the short duration of their disease. Seventeen had had more than one exacerbation, and disseminated lesions seemed to have been established clinically. Only three had had only one exacerbation; in these, the disease was characteristic in respect to age of onset, clinical findings, and remissions. Even if these three cases are eliminated from the study, the remaining data are conclusive. Early treatment was in all respects very important if further deterioration was to be prevented.

In a further analysis of the early-, intermediate-, and late-phase cases, it was shown that the *early-phase patients* did very well on the low-fat diet. Approximately 95 per cent of the fifty-six patients in this group either improved or remained the same during the period of seventy-six months on low-fat diet. The intermediate- and late-phase cases did less well. Seventy per cent of the *late-phase patients* continued to deteriorate; only 30 per cent remained the same or improved during their seventy-eight months on the diet. The *intermediate-phase patients* were also intermediate with respect to their response to the diet. About two-thirds of the entire patient group followed the diet closely; the other third, only fairly well. Thirty-two patients were excluded from analysis because the diet was poorly followed. These patients habitually consumed two to three times the hard fat prescribed, and often more.

Discussion

Our study appears to indicate that patients with multiple sclerosis are benefited by a low-fat diet. This has been shown in two ways. First, the frequency and severity of exacerbations are remarkably reduced, and second, the performance of patients is either improved or the speed of their deterioration is slowed for a period of observation lasting up to nine and a half years.

Throughout our study, our method of evaluating and recording exacerbations remained as nearly the same as possible. From a pre-diet exacerbation rate of approximately 1 per patient year, the rate fell to approximately 0.3 per patient year during the first year on the prescribed low-fat diet. After the first year, the exacerbation rate continued to fall slowly to below 0.05 exacerbations per patient year at the end of five years in patients placed on diet after January 1952, and to the same level in seven or eight years in patients placed on the low-fat diet between 1948 through 1951.

Our figures suggest that the low-fat diet as prescribed since about January 1, 1952 is more effective than that given prior to this date. Butterfat was eliminated at this time, animal fat was limited to 15 gm. a day, and vegetable oil to 15 gm. The 5 gm. cod-liver oil were continued. Another factor to be considered, however, is greater enthusiasm in the application of the diet as the result of experience gained during the early years of the study. Nevertheless, I believe that changes in the diet were the more important. If the decrease in exacerbation rate noted above were due to psychologic factors, we

would have witnessed a significant increase in exacerbation rate when we left Montreal in the spring of 1954. This did not occur.

It is clear that early diagnosis and treatment before significant disability has developed are necessary if one hopes to benefit the patient significantly. Patients in whom treatment was started in the early phase of the disease or shortly after its onset have remained remarkably free of further stigmata of the disease. Most of these have improved and are working full time. If started after significant disability developed, patients were more apt to continue to deteriorate slowly, even though exacerbations did not occur or were very mild.

Conclusions

Patients with multiple sclerosis have been observed on a low-fat diet for a period of nine and a half years. The frequency and severity of exacerbations in all cases were significantly reduced, and the performance of patients first treated in the early phase of the disease was improved or unaltered during this period. In the intermediate- or late-phase patients, the course of the disease was less dramatically improved. It appears that if the low-fat diet is instituted early and adhered to carefully, the course of the disease is significantly improved.

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Problems of Delegation

Delegation is not just a simple matter of giving a subordinate a job to do. Newman, in his book *Administrative Action*,[1] has described the process as consisting of three aspects:

(a) The assignment of duties by an executive to his immediate subordinates.

(b) The granting of permission (authority) to make commitments, use resources, and take other actions necessary to perform the duties.

(c) The creation of an obligation (responsibility) on the part of each subordinate to the executive for the satisfactory performance of the duties.

Stated in simple operating terms, it might go something like this: Assign duties to a subordinate, give him the necessary authority to carry them out, and hold him accountable for results. It is to be noted that while the process creates an obligation or responsibility for the subordinate, the act of delegation does not relieve the boss of his own responsibility for the results. For example, my boss hands me a job, I delegate it to a subordinate, and for some reason proper results are not obtained. My boss holds me accountable, I am still responsible. I can't say to him, "Sorry, my subordinate didn't produce." His answer quite properly is, "But isn't that your problem?"

This is no doubt one reason, but not the only one, for the failure of many executives to delegate. A boss is afraid the subordinate will not come up with first-class results, and it is he who must account for results to his boss. Delegation is therefore a risk-taking process. Bosses have to assume these risks. Through proper training of subordinates they are able to minimize the risks.

The security which comes when a boss does everything himself is temporary, illusory, and self-defeating. It is bad for him, bad for subordinates, and bad for the organization. If a boss is to be administratively competent, he must delegate.

I am not trying to suggest any patterned program for training in delegation because I know that there are numerous approaches possible. I do feel that any program must:

(a) Convey a sense of its importance, and

(b) Portray clearly its nature, extent, and limitations

Finally, I believe quite strongly that the way to learn delegation is to delegate. I may add that in our own organization one of the first questions we raise in appraising an officer is, "Does he work with and through people by delegating, and do people grow under his leadership?"—*Excerpted from "Achieving Administrative Competence—The Executive" by Robert N. Hilkert.* Michigan Business Review *11:24 (July), 1959.*

[1]NEWMAN, W. H.: Administrative Action. N. Y.: Prentice-Hall, Inc., 1951, p. 166.

Dietary Use of Liver Through the Ages[1]

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PRIMARILY, MAN has eaten foods which were native to his environment. It is imagined that primitive man drank the blood and ate the internal organs and bone marrow of the animals before he condescended to eat the muscle portions, and the Furnases believed (1) that man's first experiences in meat eating were the results of tracking diseased or wounded animals until they died. Man's dietary advances are marked by the invention of hunting weapons, the development of cookery and methods of preservation, and the cultivation of plants and animals for food (2). As his knowledge widened, domestication and transportation of animals began.

Superstitions Pock the Dietary History of Man

Animism, the theory that humans appropriated the characteristics of animals whose flesh they ate, flourished with variations on the main theme. In many cases, a particular part of the flesh or organ was sought, according to the prevailing belief as to which was the seat of the desired quality (3). Tribal chiefs and warriors commandeered their choice of meats and left the remainders to the weak and submissive (4). Medicine men were paid tribute by donations of organs or other parts of captured animals which are definitely looked down upon by us today. The muscle and steak were left for commoners (5).

During one phase of man's development, the internal organs were allocated for and restricted to sacrificial offerings to the gods. Since the eating of these parts by ordinary men was prohibited and their use reserved for the gods and the priesthood, it may be that their lack of popularity in some sections today is the vestige of a religious taboo which has persisted long after the rite of burnt offerings disappeared (6). Fishbein laments (7) that "it is a stock argument of radical vegetarians and other misguided persons that meat eating will deaden the moral and intellectual faculties." He points out that Moses, David, Solomon, and Jesus ate meat. Inquiry into dietary practices of a group of Negro women in the United States (8) disclosed that liver was among the foods listed as taboo, but the reason for this was not divulged.

Occasionally, evaluation of ancient practices points the way in scientific studies. For example, polar bear liver was considered poisonous by most Arctic explorers (9, 10). When Stefansson learned that this belief was mainly based on hearsay from Eskimos, he attempted to discover the foundation of the theory. Finding that the reason seemed to be part of a religious taboo, he proceeded to test the effects of eating polar bear liver. Summing up the experiences of his group, he stated: "Fully three-quarters of the livers ever eaten by me or others when I have been present have had no bad effect. The conclusion appears to be that certain polar bear livers are slightly poisonous while others are not." However, chemical and biologic investigations of the livers of polar bears and seals by Rodahl and Moore (11) proved that severe illness which may follow from eating these livers is due to intoxication from huge amounts of vitamin A which they contain, since a serving of about three-quarters of a pound (the average serving) would provide 7½ million I.U!

Availability of Liver Hinges on the Meat Industry

Cattle were first reared in the Near East and poultry was first domesticated in Burma (12). Egyptian figures in tombs of nearly five thousand years ago depict slaughter and cookery of cattle and poultry (13). Antique coin designs commemorating famines or good harvests further demonstrate man's con-

[1]Eighth Lydia J. Roberts Award Essay, read at the 42nd Annual Meeting of The American Dietetic Association in Los Angeles on August 27, 1959. This Award is made possible by a grant from Gerber Products Company, Fremont, Michigan, for the purpose of encouraging historical study of nutrition. Presentation of the Award was made at the Annual Banquet of the Association on August 27, by LeVelle Wood, President, The American Dietetic Association (see JOURNAL, page 948, September 1959).

cern with his food and future (14) and reports of sausage-making in Babylonia as early as 1500 B.C. indicate measures taken to prepare for seasons of scarcity (15). Galen (circa A.D. 130-200) assumed that everyone knew that brine and sea water preserved meat and that drinkable water spoiled it (16), and the Roman agricultural writer, Columella, recorded many recipes for pickling foods in brine (17). Selection of meat foods depended on availability of wild animals and on the purpose for which an animal was domesticated. Draught animals which were no longer useful were eventually eaten in some areas (18), but in the seventh century these animals were considered unfit for consumption (17). Ultimately, cattle were used as food, but for many years both meat and milk were secondary matters. Goat meat was disdained in the sixteenth century, when pork seemed to be the favorite (17).

From the Middle Ages until the enclosure acts of the eighteenth and nineteenth centuries, the open field system of farming with common rights in pastures prevailed in England (19). With local variations, such communities existed through northern Europe, including northeastern France and extending to the Danube Basin. The beginning of the enclosure acts promoted private initiative and the development of root crops as well as the planting of grass seed. Thereafter, turnips and hay could be stored for feeding animals through the winter and thus a continuous supply of meat could be planned (17). According to Lord Ernle (20), the English did not import dead meat until after 1877.

As they had done before coming to America, early colonists made thrifty use of all edible parts of meat, including the liver. Early explorers and travelers turned to the forests for food. Deer were plentiful, birds familiar to Englishmen at home were found, and wild hare and squirrels were abundant (21). Great flocks of turkeys native to North America (12), soon fled from the settlers but were still plentiful in Georgia in 1733 (21). *Home Life in Colonial Days* by Earle (21) tells of the northern colonies' cow-keeps, sheep-herds, fence-viewers, haywards, and hog-reeves who were paid by the town to tend all the cattle owned by the inhabitants. Soon, cultivation of cereals in greater amounts than were needed for immediate consumption meant that men were able to feed animals with these excess crops and be assured of animal food supplies during the winter months.

In the United States, the cattle industry has grown entirely from imported stock, since the bison was the only native meat animal. The first important shipment of cattle into New England was in 1624. Because imported cattle readily succumbed to the Spanish longhorn tick, Spanish longhorn cattle predominated on Texas ranges until 1891 when quarantine and control measures eradicted the tick. Then, breeding of these cattle with shorthorns introduced by Mormons traveling to Utah and by gold seekers going to California resulted in improved herds (22).

The American Indian ate nearly all parts of any animal he could capture and relished the internal organs (23, 24). In the Great Plains and mountain areas, the buffalo, which was to the Indians their staff of life, was being exploited by pioneers and hunting parties from newly settled ranches (25). In buffalo hunts, the cuts a butcher took depended on how plentiful the buffalo were, but he would probably take the liver (26). Of a buffalo meal, Ruxton wrote (24): "The white man would eat the liver raw as soon as it was taken; he seasoned it with the gall or sometimes with gunpowder."

Advancements in refrigeration and transportation in the Civil War period accelerated the entire meat industry. In 1865, the Star Union line converted more than thirty cars to iceboxes on wheels (27). Silos were adopted and, with them, came better feeding and better stock. The first regular meat packer in the West is said to have been Elisha Mills of Cincinnati and the first packing houses were in Chicago and St. Louis. Among the early livestock publications was the *National Live-Stock Journal*, which appeared in 1870 (28).

Selectivity in meat purchases increased as butchers' supplies rose. This same selectivity caused meat prices to rise. Schlink and Phillips (6) cite Thomas DeVoe, "the literary butcher, writing in 1867 in *The Market Assistant*":

> There are . . . many people of limited means who "do marketing" (who) seem to have no desire or wish to practice economy, but rather to appear extravagant, if it lies in their power, by purchasing everything at the highest prices . . . I have often observed that those who plead against the dearness and extravagant prices of meat . . . would rather pay their last dollar for half as much meat in an expensive steak or chop.

Unfortunately, the rapid industrialization of meat processing was not without tribulation. Lack of sanitation in meat handling soon caused a public clamor that subsided with enactment of the pure food and drug laws. The Federal Meat Inspection Act of 1906 proposed to protect the consumer by guaranteeing that meat in interstate commerce came from healthy animals and was slaughtered under sanitary conditions (29).

The upheaval of World War I created a food shortage. One problem was to create a food surplus in America to relieve the need in Europe. Cheaper cuts of meat supplemented the traditional expensive steaks, and some restaurants catered to the national love of novelty by serving horse, rabbit, and even whale meat. Meatless days were observed, and the administration advised all to "eat plenty, wisely, without waste" (30).

The National Live Stock and Meat Board supported research which indicated that liver was particularly valuable in blood regeneration. It now feels, from the standpoint of the meat industry, that the research has definitely increased the industry's income from liver as well as its usefulness. Prior to this research, liver was used principally in tankage and for animal feeds (31). Until 1926, calf's liver was so plentiful and reasonable that other kinds of liver were neglected (32). Discovery of liver's specific therapy in treating pernicious anemia caused the price of calf's liver to soar and remain higher than beef, pork, or lamb liver, even though subsequent evaluation of these items showed them to be of comparable nutritional worth (22). The price of liver, alone, is a significant indication of its advance as a valuable meat. As recently as the thirties, liver was cheap enough to be included as a very substantial component of dog foods, and butchers were frequently willing to give liver to customers for pet feeding (33).

As in World War I, during World War II a concerted drive to conserve food brought on another parade of "meatless days." Restaurateurs' interpretation of the word *meat* apparently was limited, and liver, sweetbreads, and kidneys were not excluded from their menus (6). Ceiling prices, rationing, and the accompanying black market kept the meat industry in an uproar during this era. Higher wages brought increased expenditures for food. Staggs, at a conference of dietitians in 1946, presented this view (34): "Whenever people have more money to spend they spend more for meat as well as for milk . . . in other words, they spend more for the foods which are most essential in the diet." A study of the food market picture by *Fortune* magazine (35) indicated that during the period from 1947 to 1953, the percentage spent for food eased off but rising income pushed up total spending and middle-income groups bought "service" foods. In 1944, there were only ten markets selling self-service meats, but by 1952 there were over 5300, mostly large chain stores (36).

Must Men Starve? by Oser (37) points out that about two-thirds of the world's people are not getting enough to eat. It is not enough to increase the available food supply. What is provided must be considered acceptable by the people. In Africa, the British government supplied veterinary service to cattle-raising tribes, but this did not increase the food supply, because these people love their cattle and kill them only on ceremonial occasions. Since the ceremonial occasions do not increase in number, the saving of cattle through veterinary aid merely resulted in too many cattle on the land (38). In Ethiopia, also, farm people do not eat their cattle unless they are afraid they are going to die from disease (39). Today the Masai tribe of herdsmen in British East Africa make their meals almost entirely of milk, of blood drawn at systematic intervals from the jugular veins of the cattle, and of meat on occasion and have little else (40). Among the poor people of Macedonia, meat is eaten only after long fasts, on chief church holidays, when a farm animal sickens, or when a wild pig is killed (41). Natives of Anglo-Egyptian Sudan have a belief which to them is their religion, namely, that every person has a soul which resides in the liver and that character and physical growth depend on how well he feeds that soul by eating the livers of animals. The liver is so sacred that it may not be touched by human hands. It is, accordingly, always handled with their spears or sabers, or with specially prepared forked sticks. It is eaten both raw and cooked. And, in the Fiji Islands, cannibals have, until abandoning this practice, honored the special food values of liver (42).

Before European settlement, Australian aborigines were a seminomadic hunting people who believed that the vegetable and animal foods on which they depended had been provided for them by supernatural agencies, and that all they need do was claim what was due them (43). Contrary to the customs of other peoples, the Australian hunter's skill was not used to gain power in the tribe, and his reward was the general approval of the tribe and the poorest cuts of meat (44). An Advisory Council on Nutrition was established in Australia in 1936 and reported to the League of Nations that, although meat consumption was high, a deeply-rooted prejudice existed against the eating of internal organs, including liver (45). South America's beef industry is of great magnitude, but until they are able to meet the rigid import inspections of other countries, particularly the United States, there is small likelihood of much export (46).

Perhaps the biggest meat-eaters of all are the Eskimos, who are referred to as a carnivorous race (9, 10, 47). Because there is no edible vegetation, they live on meat of animals indigenous to their homes. Thomas maintained (9) that the Eskimo prefers red meat, eating the flesh and liver. Birket-Smith of Denmark said (47) that the reason that glycogenic liver and whale hide are such relished dishes might be a result of unconscious craving of the organism for carbohydrates. Earlier, Stefansson had written (10) that the tastes of the northern hunters who live on meat alone are nearly uniform, whether they be Indians, Eskimos, or white men resident with either people. He then went on the describe the utilization of caribous by Alaska and Mackenzie River Eskimos: "It is seldom . . . that caribou hams are eaten when there is enough of other meat. The hams, some of the entrails, the lungs and liver, the outside meat from the neck and brisket, and the tenderloin are the food of the dogs."

Taste Enjoyment of Liver Has Been Widespread

The most luxurious eaters of the Roman Empire valued only the livers of geese and by a fattening process increased the size until the liver often weighed 2 lb. Striker told the tale (48) about a queen of France who spent 60£ sterling in fattening three geese, whose livers she wished to render more than usually delicate. Citing Soyer's *The Pantropheon*, he went on: "The taste for this delicacy was illustrated by an epicure who prayed that he might have a throat as long as the stork's in order the better to enjoy such a delicious food." Brillat-Savarin reflected (49) that when Catherine dé Medici left Italy to become Queen of France, there was a sudden burgeoning of the art of cooking which followed her arrival with a retinue of Italian cooks, and *la cuisine* became a matter of passionate concern in the two subsequent centuries. There were no large joints of meat served until the time of Charles the First (1600-1649) (21). A British government official and diarist, Pepys (1633-1703) recorded obvious pleasure in every kind of meat from calf's heads to jowls of salmon, but scarcely mentioned vegetables and fruits (50, 51). Madame du Barry, giving a nine-course supper for Louis XV, included pike liver pate in patty shells (52). Pratt and Bailey in *A Man and His Meals* (52) credit a recipe including liver to the year 1790. During the latter half of the nineteenth century, specialty meats, including liver, were chosen for entrées, accompaniments, or appetizers, but seldom for the main course in elaborate menus. In New York at Delmonico's, bills of fare on state occasions during this period often included pâté de foie gras in mousses and aspics, but no use of liver as a main course was shown (53).

Gourmet magazine recently published (54) an article titled "High Livers" in which comparative definitions are given:

> High livers are, of course, those fortunate human beings who have the inclination, the means, and perception to conduct their lives in a cheerful and charming fashion. But, in the bon vivant's vocabulary, high livers are also a title which chicken livers can justly claim. These delicate morsels are one of the comparatively few foods that can come to breakfast, lunch and dinner with consummate ease; yet because of their lush texture and individual flavor, chicken livers seem particularly at home at a splendid dinner, given in the grand style.

By review of *The Modern Housewife* (circa 1849) by Alexis Soyer, the magazine details the use of chicken livers in soup, for garnishment of the poultry course, as an entrée, and in the savory course, which is described as a sort of reverse hors d'oeuvre of the Victorian period.

Further testament of liver's popularity is found in *Die "Süddeutsche Küche* (The South German Kitchen) by Katharina Prato (55). Written for "beginners and practical cooks," the book offers instruction on liver preparation. *Dr. Chase's Third, Last and Complete Receipt Book*, published in Detroit in 1904 (56), gives a recipe for liver hash which the author lauds as "very nice for those who are fond of liver." Liverwurst was a favorite item found in German delicatessens, which by the last half of the nineteenth century were enjoying a large trade (27). Hinman and Harris of Swift and Company (57) have specified that braunschweiger sausage is made from livers and pork, but that the more common liver sausage is composed of meat food products and pork liver and may contain cereal or dried skim milk.

Changing times mean changing food habits. It was about 1900 when the "meat for breakfast" era passed (58). During the flurry over liver's therapeutic value, at least one nostalgic gentleman reminisced: ". . . years ago liver and bacon was a common breakfast" (59). In 1937, the Nutrition Committee of the League of Nations placed considerable emphasis (45) on the importance of using liver in the dietaries of people throughout the world. Its value in both normal nutrition and in diet therapy was emphasized. Fish-liver oils were also discussed, but more as a pharmaceutical measure than as a food *per se*.

Cresting the upswing from the great depression, the New York World's Fair opened in 1939. In the kitchen of the old Ritz Hotel, it was found that the popularity of the standard American favorites, such as broiled steak and chicken, was giving way, if only temporarily, to continental dishes made with *les abats*, the meat specialties. Louis Diat, who had been at the Ritz for thirty years, had been disappointed by Americans because they did not share his French countrymen's enthusiasm for the livers regarded so highly in Europe. He was relieved to see increased use of liver when its value became publicized (60). Estimation of liver as a delicacy continues to appear. Goose livers and chicken livers should be used, according to Escoffier (61), in soufflés, timbales, terrines, aspics, mousses, and hors d'oeuvres. He says: "Calf's liver is served chiefly as a breakfast or luncheon entrée. Nevertheless, in ordinary menus, it is sometimes served as a *relève, braised* and whole".

Seemingly taking a more liberal attitude, *The Gourmet Cookbook* (62) presents recipes for liver preparation without fear of their misuse. Warning that the forced feeding of geese to obtain the necessary fat livers for pâté de foie gras is not legal in this country, the publishers suggest the substitution of chicken livers. Pâté de foie gras was popularized after development of a fattening process at Strassburg in Alsace. Geese were restricted in pens too small to allow the animals to exercise. Then they

were stuffed with bread pills until their livers grew to grand proportions (52). Calf's liver is in the play of canape artistry, too. *Esquire's Handbook for Hosts* (63) bids the bachelor to try "Pâté El Borracho," which requires ½ lb. calf's liver.

Distribution of "favorite recipes" has been a lucrative enterprise of women's organizations for years. Distinctive among the efforts is the collection titled *Chopsticks* (64) from Formosa. Printed in Taipei to raise educational funds, it contains a recipe for liver with mushrooms and bamboo shoots.

Today culinary agility is an open competition, at least in the United States. The fun of outdoor cookery, the convenience of new appliances, and the challenge of rising stacks of cookbooks aimed at every age group in every circumstance have all promoted participation in cookery as a hobby. Imaginative table settings, curious gadgets, and colorful costumes add to the games. Thus situated and spurred by the latest editions, anyone can participate. One of the recent and elaborate guides to cookery is *Life's Picture Cookbook* (65). It not only provides recipes but also contains photographs of sumptuous potentials. Going a step further, the book describes famous restaurants which compound these same foods by these same procedures. "Do-it-yourself" is today's code, and one may try "Liver Alla Veneziana" as they do at Royal Danieli in Venice, or "Pâté of Duck" by the recipe of Pyramide in the old Roman town, Vienne.

Another route to continental cookery at home is by use of "old family recipes," as in the case of a young California dietitian, who is quite "loyal" to Yugoslavian liver dumplings. Here is reliability, familiarity, and certain satisfaction.

Liver's Potency Has Been Long Appreciated

Egyptian papyri of 1500 B.C. record the use of liver in treating visual disorders (66, 67); at the same time, the Chinese were also using liver, probably for night blindness (68). Assyro-Babylonian ophthalmologists named night blindness *Sin-lurmâ* (69). Roasted ox liver dipped in honey was Hippocrates' recommendation, and other livers have performed the dramatic cure for centuries (68). Dutch poetry of the fourteenth century mentions goat liver for "he who cannot see at night" (70). Medical writers of France in the sixteenth century advised liver for the cure of night blindness (68), but in England the first mention of liver for the eyes was in the seventeenth century (70). Eye patches worn by pirates and fishermen were meant to protect one eye from the glare during the day so that it would be effective in the darkness. The patch was then moved to the offended, night-blinded eye to allow its recuperation (71). Bird's liver, cooked or raw, was the cure at that time.

Aykroyd (72), in his studies of dietary deficiencies in Newfoundland, found that night blindness was the most common deficiency disease and that treatment with bird's liver was known to be promptly effective. He was told of a custom of steaming the eyes over the cooking liver, which was then eaten. Periods of famine in Austria and Russia have produced epidemics of night blindness (67), and it was a known result of malnutrition in India in 1908. Again, it disappeared when patients were fed liver (71). In 1923, near Calcutta, the popular remedy for night blindness was to poultice the eye with an exudate of fresh goat's liver and to include liver in the food (73).

Realization that liver's food factor was valuable in treating other eye diseases occurred at the start of this century. Mori, in 1904, described a syndrome known in Japan as *hikan* (73). Examination of children revealed keratomalacia as well as xerosis of the conjunctiva and xerophthalmia. He stated that the disease did not occur among fisher folk, but among people whose diet was largely of vegetable origin. Prompt relief of the eye symptoms was observed when cod-liver oil was administered. Chicken livers and eel fat were also found to be effective remedies. Understanding of the specific nutrients needed to prevent and cure these eye diseases began to unfold in 1913 when Osborne and Mendel (74) proved that a fat-soluble factor was involved. McCollum and Simmonds, in 1917, called the factor "fat soluble A" (75). Subsequent studies of the nutritional properties of liver showed its high content of vitamin A.

Particular therapy with liver has not been confined to night blindness. Pliny's *Natural History* (76) gave many current remedies for the bite of a mad dog, including the liver of a he-goat. Salpe, a native of Lemnos, believed in the use of the liver of a mad dog as a cure for its bite (77). Pliny recommended vulture liver for epilepsy (78), and Guainerius (79) and Sextus' *Book of Medicine* (78) advised potions of vulture livers and blood for palsy. Otter livers for tuberculosis were part of the early Chinese druggist's stock (80). Much later, in 1941, Pottenger emphasized (6, 81) to the American Academy of Tuberculosis Physicians the worth of raw, chopped liver in a high-protein diet for tuberculosis. Liver soup was used in treating sprue by the native doctors of Ceylon for centuries (82).

About fifteen years ago, scientific support (83) was given to this practice, and in 1949, McLester stated (84) that liver should be given both parenterally and by mouth. He suggested a mixture of ground raw liver and equal amount of tomato juice.

Porges (85) noted the diuretic effect of a liver diet, and Grossman (86) believed that liver contained a diuretic substance other than urea. On the other hand, in 1941, Schaffer and his co-workers

(87) confirmed the occurrence of an antidiuretic substance in beef liver. Other workers have demonstrated the nephrotoxicity of liver (88-91). Patients having gout are warned (84, 92) against eating liver because of its abundance of purine bases. Donaldson and Tasker of Johannesburg (93) reduced the mortality from pneumonia among native workers from 13 per cent in 100 untreated cases to 8 per cent in 200 patients who were treated with extra vitamin A in the form of "radiostoleum" or liver, but Orenstein's work (94) failed to confirm this finding.

Blood Regeneration with Liver

Investigations into the influences of diet on blood regeneration in simple anemia published in 1920 by Whipple, Robscheit, and Hooper (95-97) showed the particular efficiency of liver in rapid regeneration of hemoglobin. A few years later, reports by Whipple and Robscheit-Robbins (98) on blood regeneration in severe anemia appeared. They observed that even after discontinuance of a liver diet, there was a carry-over period during which the manufacture of hemoglobin and red cells was continued. Compared with striated muscle feeding, beef liver in severe anemia was associated with maximum regeneration of hemoglobin and red cells (99). Further evaluations showed chicken livers to be as favorable for hemoglobin regeneration as beef or pig liver, and by contrast, fish liver was shown to be inert (99). Liver sausage was also tested and showed a moderately high potency for new hemoglobin production which depended on the amount of liver in the sausage (98). It was felt that as an accessory dietary factor, liver sausage might prove to be quite valuable. The work of these men proved to be of great importance in future studies of the dietary power of liver.

In *The Importance of Living* (100), Lin Yutang in 1937 stated: "Western medicine has only within the past decade discovered the blood-building value of liver, while Chinese have all along regarded it as an important tonic for old people."

Until this century, treatment of pernicious anemia was notably unsuccessful and the course invariably (101) fatal, as the name implies. Recognition of the disease as a clinical entity came between 1822 and 1855 (102). Habershon, in 1863, directed his attention to "the nervous supply of the stomach" (103), and eight years later, Pepper (104) saw the need for nutrition with foods of the most digestible form.

Until 1926, when Minot and Murphy published "Treatment of Pernicious Anemia by a Special Diet" (105), there was no known effective treatment for the dread disease. Basing their experiments with human beings on Whipple's and Robscheit-Robbins' results with liver feeding for blood regeneration in dogs, they devised a diet high in liver, high in complete proteins and iron, and low in fat. They specified that from 120 to 140 gm. and sometimes even more of cooked calves' liver or beef liver be included in the diet daily. Following this diet, patients showed a prompt, rapid, and distinct remission of their anemia, coincident with at least rather marked symptomatic improvement, except for pronounced disorders due to spinal cord regenerations.

Scientific interest in liver was high, and numerous investigations followed to determine the nutritive characteristics of liver. Reports indicated studies of iron content (106); nutritive value (107); vitamin A content (108); stimulating effects on maturation of cells in bone marrow (109); protein value (110) vitamin E value (111, 112); manganese content (113); copper content (114); unsaturation of neutral fats (115); vitamin G content (116); vitamin D content (117); pantothenic acid content (118); and riboflavin content (119).

Soon after Murphy and Minot introduced the liver diet, Cohn and co-workers reported (120) studies of the nature of the active principle effective in pernicious anemia. In these studies, fractions of liver were fed to patients with this disease. Those extracts were considered to contain the active principle that produced an increased concentration of reticulocytes and erythrocytes in the peripheral blood. Davidson (121) urged the use of fish liver extracts as an economical form of therapy, overriding Whipple's and Robscheit-Robbins' statement in 1927. It was also found that extracts could be prepared from the livers of the ox, sheep, horse, Indian elephant, African rhinoceros, Barengo giraffe, and Nylghare antelope (122).

Allergy to injectable liver extracts was evidently a problem for some patients, however, and Feinberg *et al.* (123) decided that this type of allergy had neither species specificity nor organ specificity, but Bauer and associates (124) felt that the sensitivity was species specific and not organ specific. In England, during World War II, patients sensitive to injection were not permitted to take liver extracts orally because this was decreed too wasteful by the Ministry of Health (125). In 1933, Murphy had repeated the need for massive dosage with liver (126), and in 1935, again supported Whipple's theory of whole liver enhancing hemoglobin formation (127).

Discovery in 1948 (128) that crystalline vitamin B_{12} from liver extract was the principal antipernicious anemia factor brought the solution to the problem of the disease near. Liver therapy was so definitely recommended that in 1941 in Remscheid, Germany, a practitioner who had used alternative treatment, ending in the death of the patient, was convicted of homicide (129). The court ruled that in critical cases of pernicious anemia, a practi-

tioner must apply the therapeutic agents which are recognized to be of paramount importance.

For their distinguished work, Whipple, Minot, and Murphy were awarded the Nobel Prize in Physiology and Medicine in 1934.

It seemed apparent to Bubert in 1928 (130) that the administration of the Murphy-Minot diet was of distinct value in a case of subacute combined sclerosis. Additional studies (131) of liver's potential in neurologic disorders were made, and Davison reported (132) in 1941 that in nine of ten patients observed, there was improvement of subjective neurologic symptoms associated with pernicious anemia. Liver and vitamin B_{12} are used extensively in Great Britain in the treatment of multiple sclerosis (133). The justification for their use presumably lies in their effect on general health, since there is no evidence that a deficiency food factor plays any part in the etiology of the disease.

During the period of intense study of liver, attention was also given to its role in eosinophilia (134, 135); leukopenia (136); appetite stimulation (137, 138); growth promotion (139-141); reproduction (142); and ovarian development (143). Questions of the relationship of liver to cancer were also raised. Laboratory tests of tumor production in tar-treated rats (144, 145) indicated that liver feeding seemed to accelerate the appearance and growth of warts, but development of malignancy was neither lessened nor increased. Martin and Koop (146) dealt with vitamin-B deficiency in patients having oral cancer by treatment with liver and yeast preparations as well as specific treatment for the lesion.

Pediatric liver feeding also has received attention (147-149). Roedel (150) had excellent results in infants having exudative diathesis with Hamburger's milk-free diet. It is based on a water solution of rice, groats, rusks, or wheat flour, with finely ground liver supplying the necessary proteins. Strained liver has been recommended for normal nutrition of infants (1, 84, 151), and by 1946, chopped and strained meats, including liver, were being marketed (27).

Today, diets high in essential fatty acids but low in animal fats are being prescribed, especially for patients having atherosclerosis (152). One of these diets, devised at the Institute for Metabolic Research, Oakland, lists liver, fish, or lean fowl as the only meats allowed (153).

Current Regard for Liver Is Diverse

The variety and quantity of nutrients contained in liver are so great that it has been called "magical" (6), "protective" (154), and a "panacea" (155). It is known to contain protein of the highest caliber, a rich supply of vitamin A and all of the B vitamins, and an abundance of iron and copper. Nutritionists have suggested that it be included in normal diets at least once a week. They particularly stress the need for this food during pregnancy (156) and when there is unfavorable metabolism (157).

Today, however, acceptance of liver as an enjoyed food is not as high as it might be, from both nutritional and economic viewpoints. Liver is reported to be disliked by one-fourth of a group of college women who were questioned about their food preferences (158). Another group of students (159) rejected it six times more frequently than fish. Bryan and Lowenberg (160), observing the influence of fathers on food choices of their children, reported that out of sixty-one preschool children, only eight liked liver; of sixty-one fathers, thirty-six liked liver; and that only seven of the children *and* their fathers liked liver.

The latest report of liver's acceptability, however, is a sharp contrast. Recent tests of "ration-dense" foods aboard the nuclear-powered submarine *Nautilus* and the destroyer *Uhlmann* were mainly concerned with space-saving qualities. Nevertheless, consumer acceptability was also scrutinized. A news story in the San Francisco *Chronicle* (161) recently reported:

> Indicative of the acceptance given to all the test items is the fact that the entire ship's company ate and enjoyed (preportioned) liver, usually one of the most poorly accepted items on any ship's menu.

Perhaps the gastronomic prestige of liver is about to rise again.

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Radioactivity in Foods

Levels of strontium-90 in wheat, cabbage, and potatoes from twelve states and soybeans from Colorado were within the safe limits set by the National Committee on Radiation Protection and Measurements in the most recent tests made by the Food and Drug Administration. Highest values were found in wheat samples from Colorado, with lowest values occurring in potatoes from Ohio.

Further tests of total beta radioactivity have also been made, even though of themselves, it does not constitute a health hazard and there are no standards by which to evaluate it without knowledge of the individual isotopes present. Such measurements are made to determine as rapidly as possible what foods should be analyzed for strontium-90. Through these studies, it has been learned that washing associated with canning or freezing of spinach reduced total beta radioactivity by an average of about 60 per cent.

Fresh fruits grown in 1958 and 1959 averaged about one-tenth as much total beta radioactivity as fresh vegetables grown in the same period. These differences are ascribed to: (a) the relatively greater surface area of vegetables and consequent greater chance for retention of falling dust during growing; (b) nearness of the vegetables to the ground, with the possibility of splash-up and dust from the soil; and (c) the fact that most of the fruits, i.e., cherries, tomatoes, apples, peaches, plums, and pears, are smooth-skinned and therefore less liable to offer a clinging surface for dust. In addition, the fruits are shielded by foliage. Strawberries, having a rough skin and growing close to the ground, had the highest contamination of the fruits, with the other types of berries and grapes next.

Vegetables which were analyzed were (in rank order of total beta radioactivity): spinach, parsley, celery, lettuce, greens (including kale, collards, turnip greens, sugar beet tops, water cress, and mustard greens), potatoes, cauliflower, broccoli, Brussels sprouts, beans, and cabbage.

Tests made of imported dried fruits showed about twice the total beta radioactivity of fresh fruits grown in this country. The Food and Drug Administration believes this indicates that the levels in the imported fruits, before drying, were comparable to those of domestic fresh fruit.

Electronic and Conventional Cookery of Lamb Roasts[1]

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ELECTRONIC METHODS are becoming a part of cookery techniques in homes, hospitals, and commercial establishments. The methods of cooking meats, particularly of large cuts, are important, for they affect economy as well as quality. Although studies on the effects of electronic cookery on the quality of roasts (1-3) have been reported, their number is limited. Marshall (1), Bollman *et al.* (2), and Thomas *et al.* (3) studied beef roasts to determine cooking losses and palatability. The effects of electronic cookery on large cuts of lamb were not known; the present study was made to obtain this information.

Sixteen legs of lamb, prepared as boned, rolled roasts, were cooked by electronic and conventional methods to determine cooking losses and palatability.

Methods

Eight lambs, eleven months old, were obtained from the controlled flocks of the Animal Science Department of Washington State University. History, breed, and management were known. The animals included four Hampshires and four Columbias. Slaughtering, chilling, cutting of the roasts, wrapping, and frozen storage were similar for all. Defrosting was done at refrigerator temperatures and required three days for the wrapped roasts.

COOKING PROCEDURES

Paired roasts were cooked by two methods. One roast of each pair was cooked in the electronic range (operating at 2450 megacycles) at low speed. The other was roasted uncovered in an electric oven at 300°F. (conventional method). A specially designed thermometer containing silicone blue was inserted in the center of the meat to be cooked electronically. A thermocouple, attached to a recording potentiometer, was placed in the center of the roast cooked conventionally. Both roasts were placed in glass baking pans supported on glass tubing to simulate racks.

Cooking times and the rise in temperature after cooking were recorded. To allow for temperature rise during the standing period, the electronically cooked roasts were removed from the range at approximately 150°F. internal temperature. The roasts cooked conventionally were allowed to remain in the oven until the internal temperature reached 180°F.

PHYSICAL MEASUREMENTS

Outlines of the roasts were traced before and after cooking, and dimensions (length and thickness) and weights were measured before and after roasting. Drippings were weighed, and the evaporation losses were calculated from the total losses.

A 1-in. center slice was cut from each roast for use in the shear test. Cores, ½ in. in diameter, were cut from identifiable muscles of this center slice. The force required to shear each core was recorded with a Warner-Bratzler Shear Apparatus especially adapted with strain gauges and a recorder.

SENSORY MEASUREMENTS

Slices of lamb for taste panel appraisal were cut ¼ in. thick with a hand-operated slicer. Coded samples were served immediately on warmed plates. Ten experienced judges from the staff and graduate students of the College of Home Economics made up the

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[2]The data reported in this paper are taken from a thesis presented to the Graduate School by Marjorie E. Headley in partial fulfillment of the requirements for the degree of Master of Arts.

TABLE 1 **Design of study**

REPLICATION	BREED	GRADE	LEG	METHOD OF COOKERY*
I	Hampshire	top Choice	left	electronic
			right	conventional
II	Hampshire	top Choice	left	electronic
			right	conventional
III	Columbia	top Good	left	electronic
			right	conventional
IV	Columbia	top Good	left	conventional
			right	electronic
V	Hampshire	average Choice	left	conventional
			right	electronic
VI	Hampshire	average Choice	left	conventional
			right	electronic
VII	Columbia	top Good	left	electronic
			right	conventional
VIII	Columbia	average Good	left	conventional
			right	electronic

*Roasts to be cooked by each method (left or right) were assigned randomly.

TABLE 2 Initial weights and cooking time for lamb roasts cooked by electronic and conventional methods

REPLICATION	WEIGHT BEFORE ROASTING		RATE OF COOKING	
	Electronic cooking	Conventional cooking	Electronic cooking	Conventional cooking
	lb.	*lb.*	*min./lb.*	*min./lb.*
I	4.4	4.3	13	49
II	4.1	3.5	13	57
III	4.4	4.5	14	50
IV	3.4	3.3	13	67
V	5.0	5.4	12	42
VI	4.2	5.3	12	55
VII	5.0	5.1	12	50
VIII	5.6	5.5	12	43
Average . . .	4.5	4.5	13	52

panel. Color, juiciness, and flavor were scored on unstructured scales, and Lowe's "chew" test was used to measure the tenderness of the meat.

DESIGN OF TESTS AND STATISTICAL ANALYSIS

The plan of this study is shown in Table 1.

The data on juiciness and flavor were tested for significance by an analysis of variance.

Results and Discussion

COOKING TIMES

Speed is an important consideration in electronic cookery. In this study, as in others, electronic cookery of roasts proved very rapid. An average cooking time of 13 min. per pound for the electronic method is indicated in Table 2, as compared with 52 min. per pound for the conventional method. The time in the electronic range was longer than that recommended by the manufacturer (8 min. per pound).

Rise in temperature during a standing period must be considered in electronic cookery. These lamb roasts showed an appreciable temperature rise after removal from the range. The variation in temperature rise ranged from 29° to 34°F., with an average of 31°F. Standing period to reach maximum ranged from 15 to 23 min. From this, an approximate rise of 30°F. may be predicted for rolled legs of lamb as a convenient guide.

Marshall (1) did not observe any temperature rise in beef roasts cooked to 176°F. It might be theorized that, since Marshall cooked roasts fully to the well done stage (176°F.), the water of the tissues might have become so bound with the coagulated protein that further distribution of heat was prevented. In the roasts in this study, however, the heating was stopped at approximately 150°F. Perhaps at this degree of doneness, distribution of heat was not limited by the lack of moisture.

SHRINKAGE

Shrinkage of the roast as a whole, of course, affects the size and number of servings. In this study, electronically cooked meat lost 3½ in. in length while the roast cooked in the conventional oven lost 2½ in. The reflection of this, in terms of servings, may be important in institutional cookery. Shrinkage in thickness was the same for both methods (½ in.).

COOKING LOSSES

Comparison of the losses by the electronic and conventional methods can be made from Table 3.

Average total losses by electronic roasting were approximately 8 per cent higher than those for the electric oven. Bollman *et al.* (2) found 20 per cent greater loss for beef roasts cooked electronically to 160°F. at high speed, than for conventional roasting.

Evaporation losses, as noted in Table 3, account for the increased total losses of electronic cookery. Marshall (1) reported nearly the same evaporation losses (electronic 28.4 per cent, conventional 19.7 per cent) for beef roasts.

Drip losses were almost the same for both methods of cookery (Table 3). In Marshall's study (1),

TABLE 3 **Average losses in lamb roasts cooked by electronic and conventional methods**

METHOD OF COOKERY	TOTAL LOSSES		EVAPORATION LOSSES		DRIP LOSSES	
	Range	Average	Range	Average	Range	Average
	%	%	%	%	%	%
Electronic	40–46	43	24–30	27	14–19	15
Conventional	32–39	35	15–22	19	10–19	17

electronic drip losses (13.8 per cent) were twice as high as drip losses for the conventional method (6.5 per cent).

TENDERNESS MEASUREMENTS

No consistent difference was found in shear values for the two methods of cookery. For the electronic method, the average shear force value was 5.0 lb. (range 3.0 to 7.1), and the conventional method averaged 5.6 lb. (range 4.8 to 6.7).

Tenderness by the "chew" test was similar for both methods. The average number of chews for the electronic method was 74 (range 50 to 120), and for the conventional 71 (range 41 to 105). However, the variability from test to test was noticeable. Variability in measurements of tenderness has been noted by others. Deatherage and Garnatz (4) did not find the correlation between mechanical values and taste panel to be as close as would be desirable.

PALATABILITY

The final criterion of a method of cooking is in the palatability of the end product. Average scores of the taste panel are in Table 4.

The average score for color for the roasts cooked electronically (4.7) was higher than that for the conventionally cooked roasts (4.1). The electronically cooked roasts appeared more well done. These scores measured doneness by color and did not measure acceptability. It is possible that the conventionally cooked meat would have been preferred, had acceptability been tested.

The taste panel's average scores for juiciness were lower for the electronic method (2.0) than for the conventional (3.8), indicating that the electronically cooked meat was less juicy. This difference was significant (Table 5). These findings agree with those of Bollman *et al.* (2) and of Marshall (1) in that electronically roasted meats were less juicy.

The average scores for flavor were lower for the electronic method (3.6) than for the conventional (4.2), indicating there was better lamb flavor in the conventionally cooked meat. This difference, owing to the cookery method, was statistically significant (Table 5).

The higher scores for flavor of conventionally cooked roasts may have been due to increased browning during the longer cooking period. Causey *et al.* (5) found that general palatability of meat patties appeared to be related to the amount of surface browning.

Summary

The effects of electronic and conventional cookery were tested on boned, rolled legs of lamb from eight animals.

Electronic cookery was four times as fast as conventional roasting. To reach a final temperature of 180°F., roasts cooked electronically were removed from the range at an internal temperature of 150°F. and reached maximum temperature in 15 to 23 min. of standing. Shrinkage in size was greater in the electronic range than in the electrically heated oven and greatest in the dimension of length. Average total losses were 43 per cent for electronic cookery and 35 per cent for the conventional method. In-

TABLE 4 **Average scores* for color, juiciness, and flavor of ten judges for lamb roasts cooked by electronic and conventional methods**

REPLICATION	COLOR SCORE†		JUICINESS SCORE‡		FLAVOR SCORE#	
	Electronic cooking	Conventional cooking	Electronic cooking	Conventional cooking	Electronic cooking	Conventional cooking
I	3.8	5.4	3.2	2.5	3.9	3.9
II	5.0	3.2	2.6	4.2	3.6	4.7
III	5.2	4.7	2.4	3.4	3.2	4.0
IV	5.0	3.7	3.0	4.0	3.6	3.8
V	4.6	4.8	2.6	3.4	3.2	4.2
VI	5.2	3.8	3.2	3.8	3.9	4.6
VII	4.6	4.1	2.8	4.3	3.7	4.8
VIII	4.3	3.0	3.1	4.8	3.7	4.0
Average	4.7	4.1	2.9	3.8	3.6	4.2

*Scores obtained by checking on unstructured scales.
†Rating scale from 0 (very rare) to 7 (very well done).
‡Rating scale from 0 (extremely dry) to 7 (extremely juicy).
#Rating scale from 0 (very poor lamb flavor) to 7 (very good lamb flavor).

TABLE 5 **Analysis of variance in scores for juiciness and flavor of lamb roasts cooked by electronic and conventional methods**

COMPARISON	df	JUICINESS MS	FLAVOR MS
Judges	9	4.52**	17.83**
Methods of cookery	1	34.59**	11.77*
Judges × methods	9	2.10	0.68
Breed	1	3.42	0.19
Breed × judges	9	1.20	1.24
Breed × judges × method	9	0.04	4.49*
Among animals within breed × judges × method	118	1.57 (error)	2.27 (error)

*Significant at the 5% level.
**Significant at the 1% level.

creased evaporation losses accounted for the higher total losses, since drip losses were nearly equal for both methods. Shear values and the "chew" test were not related to cookery method. Electronically cooked roasts were more well done. Conventionally roasted meat was juicier and had better lamb flavor.

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Government Files Charges Against Food Supplement Brand

Charges of two types of misbrandings have been alleged by the government in a suit filed in the U.S. District Court at Cincinnati against the nationally distributed Abundavita food supplements. Two types of misbrandings are alleged to be made in the labeling, namely, statements falsely disparaging the nutritional value of foods that are generally available to consumers and false claims that the Abundavita products are beneficial in preventing and treating a long list of symptoms and conditions for which they are not effective.

Charges of violation of the federal Food, Drug, and Cosmetic Act were made in a seizure of three products and their accompanying literature: Abundavita Food Supplement Mineral Tablets, Natural Organic; All Purpose Abundagreen Natural Organic; and Abundavita Food Supplement Tablets. All three products are labeled as containing an "exclusive" ingredient prepared from "selected grasses grown on the Hunza Farm in naturally occurring glacial silt."

The government also charged that the labeling fails to bear information required by regulation in order to fully inform purchasers regarding the special dietary properties of the Abundavita products, which are sold house-to-house. All of the articles were alleged to be misbranded by statements which represent and suggest that food supplies generally available to the public are nutritionally deficient and inferior and that they lack sufficient amounts of the vitamins and minerals contained in the seized articles and that the latter will supply significant quantities of vitamins, minerals, and proteins to the diet because of their content of "Hunza" grass.

It is further charged that all of the products were misbranded by the following claims, all of which are alleged to be false and misleading: that they are adequate and effective to produce longevity, perfect health, happiness, hardihood, vigor, and good eyesight; enable men to be active and sexually potent until age 100; result in women being beautiful and youthful in their seventies and eighties; prevent chronic illness; appease the appetite and control weight; deodorize the body; clean and lubricate the intestinal tract; and prevent headaches, irritability, nervousness, mental depression, fatigue, dizziness, neuritis, insomnia, loss of weight, indigestion diarrhea, constipation, and dryness of the hair or skin.

Effect of Internal Temperature on Yield and Cooking Time

Cooking Choice Grade, Top Round Beef Roasts[1]

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The Ohio Agricultural Experiment Station, Columbus

TOP ROUND OF beef is one of the less expensive, but also less tender cuts which many low- to moderate-cost food services are using for roasting. A series of studies to determine ways of lowering costs and increasing yield of an acceptable product are being made. An earlier report (1) dealt with the effect of size and internal temperature on preparation losses, yield, and cooking time of Choice grade, top round of beef.

Interest has been growing in the possibility of overnight roasting of beef at low oven temperatures. If meat could be cooked at night, the ovens would be free during the day for other uses. By making more efficient use of equipment, less would be needed. This report deals with the effects of internal temperature and low oven temperature on preparation losses, yield, and cooking time of 10-lb. beef roasts.

Procedure

Choice grade top round roasts of beef weighing approximately 10 lb. each and aged for seven days were obtained through the Animal Science Department of The Ohio State University.

Eight roasts were cooked at each of three oven temperatures (200°F., 225°F., and 250°F.) to three different internal temperatures (140°F., 158°F., and 176°F.) making a total of seventy-two roasts.

The roasts were wiped with a cloth before cooking to remove any collection of drippings. Each roast was placed fat side up on a wire rack in an aluminum roasting pan 18½ by 12½ by 3¾ in. The roasts were cooked in pre-heated, heavy-duty electric ovens with the thermostats set at the specified temperature. Roasts were considered "done" when the thermocouple, placed in the approximate center of the thickest part, registered the designated temperature. Three additional thermocouples were placed at other positions in the roast. Temperatures were registered by a recording potentiometer. When the desired internal temperature was reached, the roast was removed from the oven and weighed. The meat was cooled in the roasting pan at room temperature for 1 hr. and weighed again.

The data collected included raw weight, cooking time, the weight immediately after removal from the oven and after standing 1 hr., number of 2½-oz. portions, and weight of trim loss. The drip and evaporation losses during cooking and cooling were calculated. The weights of the raw and cooked roasts were determined to the nearest quarter pound, and the trim losses were weighed to the nearest gram. Because no serving portion consisted of more than two pieces of meat, trim loss included some meat acceptable for other purposes, as well as excess fat. The weight of servings plus evaporation, trim, and drip losses was subtracted from the raw weight to calculate the juice loss. The drippings were chilled and the solidified fat collected and weighed to the nearest gram. All losses were expressed as the percentage of raw weight. Servings of meat were recorded as the number per pound of raw weight.

The cooked roasts were cut on an electric meat slicer set at "20," so that the slices were approximately ⅜ in. thick. The meat was weighed into 70-gm. (about 2½ oz.) portions and the number recorded.

Spot evaluations of palatability were judged by members of the home economics staff. Samples were

[1]This study was supported in part by funds from the North Central Regional Project 31, Effect of Large Quantity Preparation and Service on Quality and Yield of Meat, Poultry Products, Vegetables, Milk and Milk Products. Contribution No. 94-59, Ohio Agricultural Experiment Station. Received for publication December 30, 1959.

[2]The cooperation of the Animal Science Department and the Statistical Laboratory of the Ohio Agricultural Experiment Station is acknowledged.

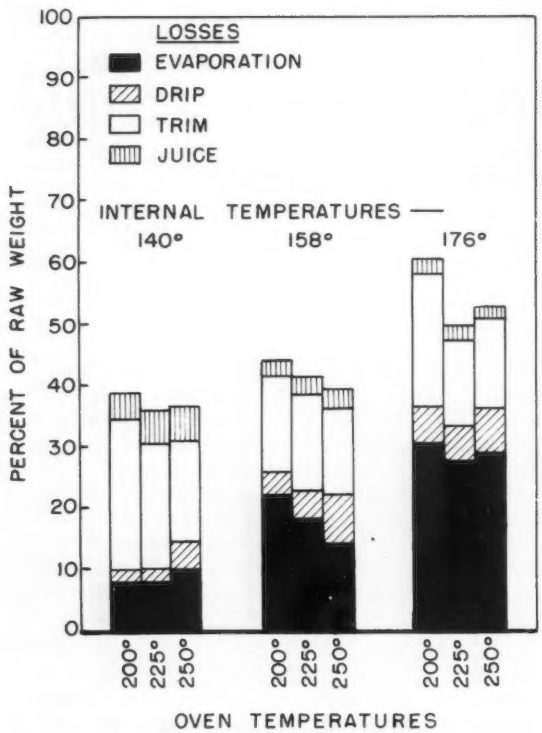

FIG. 1. *Average losses from 10-lb., U.S. Choice grade pieces of top round of beef roasted to three degrees of doneness at three oven temperatures*

scored for appearance, tenderness, juiciness, and flavor on the basis of a seven-point scale, ranging from "very good" to "very poor." Samples served to a particular judge always came from corresponding sections of the roasts.

The data were analyzed statistically to determine the significance of the differences in losses and yield due to the oven temperature, degree of doneness, and length of cooking time.

Results and Discussion

Calculations were made of the evaporation losses occurring in the roasts during cooking and during cooling. The sum of the two will be referred to as total evaporation loss. Calculations were made of drip losses on the same basis.

EVAPORATION LOSS

The evaporation, drip, trim, and juice losses are reported as percentages of raw weight in Figure 1.

Evaporation losses were greater in the roasts cooked to the two higher internal temperatures at all oven temperatures than in those cooked to the lower temperature. Among the roasts cooked to rare stage, evaporation accounted for about one-fourth of the total losses and at well-done, almost half.

The evaporation loss in percentage was plotted against time in the oven to show the rate of loss. The roasts cooked in a 225°F. oven showed percentage loss that increased at a fairly uniform rate when cooked to 140°, 158°, and 176° F. internal temperature. In a 200°F. oven, the loss was irregular and insignificant, increasing from 8.1 per cent at an internal temperature of 140°F. to 22.3 per cent at 158°F. to 30.7 per cent at 176°F. In the 250°F. oven, the losses were approximately equal at 140° and 158°F., 10.3 and 14.5 per cent, respectively, whereas at 176°F., the loss increased to 29.1 per cent.

DRIP LOSS

Drip losses, a very small proportion of the total losses, tended to increase as internal temperatures increased. There was little variation in drip losses among roasts cooked in 200° and 225°F. ovens when the meat was cooked to the same degree of doneness. Roasting in a 250°F. oven resulted in an increased drip loss at all degrees of doneness. With meat cooked to well done at a low oven temperature, the drippings appeared to dehydrate, forming a gummy, sticky mass, which became a hard, almost charred residue.

Solidified fat, separated from the chilled drippings, was weighed to estimate the amount present. This varied from approximately 0.2 per cent of the raw weight for meat cooked to rare in a 200° or 225°F. oven to about 4.0 per cent for meat cooked to well done in a 250°F. oven. The fat in drippings increased as the total weight of drippings increased, and the excess fat in the trim loss decreased.

TRIM LOSS

Trim losses varied with oven temperatures and were higher for meat cooked in a 200°F. oven than for that roasted at 225° and 250°F. Little difference was noted between the losses for roasts cooked at 225° and at 250°F.

Statistical analysis indicated that roasts cooked to the lowest degree of doneness had higher trim loss than those cooked to 158° and 176°F. at all oven temperatures. The greatest trim loss came from meat roasted to 140°F. in a 200°F. oven. Differences in trim losses for meat cooked to 140° and 158°F. and to 140° and 176°F. were greater than that for meat roasted to 158° and 176°F.

Part of the trim loss was a layer of fat on top of the roasts which remained firm at the lowest degree of doneness and was removed before slicing. When the roasts were cooked to higher internal temperatures, fat was rendered and the amount in the drippings increased. Roasts in the oven for relatively long periods developed a thin, dry, tough surface which was difficult to cut and caused the roast to tear when sliced. Another factor contributed to the relatively high trim loss of the roasts

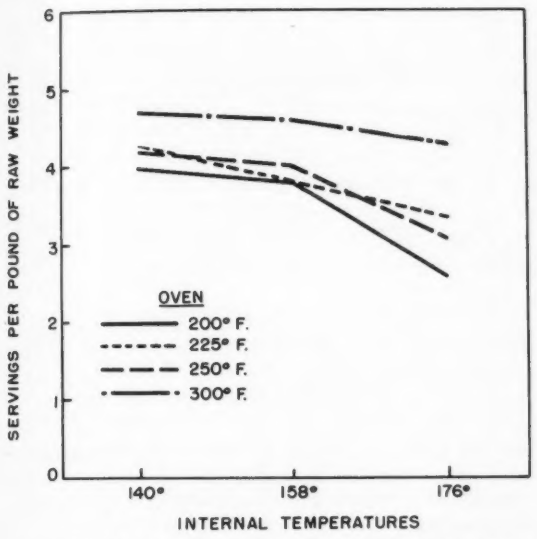

FIG. 2. *Number of servings from 10-lb., U.S. Choice grade pieces of top round of beef roasted to three degrees of doneness at three oven temperatures*

cooked to well done in a 200°F. oven. Several of these roasts crumbled during slicing, indicating extensive hydrolysis of the connective tissue. The slices that did come through the slicer intact required careful handling to prevent disintegration.

JUICE LOSS

The degree of doneness had a highly significant effect on juice loss during slicing and handling, which decreased as internal temperature increased. This decrease in juice loss was greater between 140° and 158°F. than between 158° and 176°F. For meat cooked to rare, a relatively large amount of red juice collected while the roast was being sliced and weighed out into portions. In meat cooked to well done, the juice loss was less, and it lost its red color. As previously stated, drip and evaporation losses were increased at the higher internal temperatures. As these increase, juice loss would be expected to decrease.

The differences in juice loss due to oven temperature were not significant.

TOTAL LOSSES

As might be expected, total losses were greater at higher internal temperatures, but they did not increase at a uniform rate during the roasting periods. The increase between 158° and 176°F. was greater than between 140° and 158°F. A possible explanation for this involves differences in length of cooking time. The increase in evaporation and drip losses was greater than in decrease in trim and juice losses as internal temperature increased.

Total losses were greatest at the lowest oven temperature. The difference in total losses between roasts cooked at 225° and 250°F. was not significant.

TABLE 1 Average total cooking time for 10-lb. pieces of top round of beef roasted to three degrees of doneness at three oven temperatures

OVEN TEMPERATURE	AVERAGE COOKING TIME					
	140° F internal temperature		158° F internal temperature		176° F internal temperature	
	hr.	*min.*	*hr.*	*min.*	*hr.*	*min.*
200°F.	8	8	17	42	29	59
225°F.	5	42	10	20	16	4
250°F.	5	25	6	37	12	18

YIELD

The relation of yield to internal temperature is shown in Figure 2 when meat was roasted at 200°, 225°, and 250°F. Similar data from an earlier study (1) in which a 300°F. oven was used are included.

The number of servings per pound was greater for meat cooked at 225° and 250°F. than for that cooked at 200°F. to all three internal temperatures except 158°F. The greatest yields came from roasts cooked at 300°F. to all three internal temperatures.

The number of servings per pound decreased as internal temperature increased. The differences in number of servings for meat cooked to 176°F. at the four oven temperatures were greater than for that cooked to 140° and 258°F.

COOKING TIME

The experience in this study indicates that variability in cooking time would be one of the major problems in low-temperature roasting. The cooking times reported are those for the roasts which were removed at the desired degree of doneness. Some data had to be discarded because of difficulty in estimating probable cooking time and in being present to remove the roast at the desired degree of doneness.

Total cooking time varied widely and was particularly striking for the roasts cooked to 158° and 176°F. in a 200°F. oven. Less variation was evident for those roasts cooked at the higher temperatures. Cooking times were most uniform for those roasts cooked to 140°F.

Average total cooking times were calculated and are shown in Table 1. The differences in average total cooking times are less for roasts cooked at 225° and 250°F. than for those cooked at 200° and 225°F. The cooking times per pound for 10-lb. roasts are seen in Table 2.

The internal temperature rose rapidly in the meat during the first part of the cooking period. As the roasts approached the rare stage, the rate of increase in internal temperature lessened. According to Cover (2), collagen may be hydrolyzed to gelatin

TABLE 2 Approximate rate of cooking for 10-lb. pieces of top round of beef roasted to three degrees of doneness at three oven temperatures

OVEN TEMPERATURE	RATE OF COOKING		
	140° F. internal temperature	158°F. internal temperature	176°F. internal temperature
	min./lb.	*min./lb.*	*min./lb.*
200°F.	49	106	180
225°F.	34	62	96
250°F.	32	40	74

after an internal temperature of 149°F. is reached. Since this is an endothermic process, less heat would be available to raise the temperature of the roast. The rate of increase in internal temperature is least in a 200°F. oven. When meat was cooked to well done in this oven, the final internal temperature was only 24°F. less than the oven temperature. Under these conditions, one would expect the temperature in the meat to rise slowly.

Discussion

TEMPERATURE VARIATIONS WITHIN THE ROASTS

The temperatures at different positions within the roast differed by as much as 60°F. after the first 2 to 3 hr. in the oven, then became more uniform. When roasting was completed, the variation was approximately 20°F. among the different roasts. The final internal temperature or the oven temperature did not appear to influence the variation within the roasts.

RELATION OF COOKING TIME TO LOSSES AND YIELD

The relation of yield to time in the oven is shown in Figure 3. For meat roasted in the 225° and 250°F. ovens, yield decreased with time in the oven in straight-line fashion. The rate of decrease was greater in the 250°F. oven than in the 225°F. oven. In the 200°F. oven, the rate of decrease changed during the prolonged cooking period, being greater in the latter part. This change of rate occurred after the roasts were cooked to well done at the higher oven temperatures.

Trim losses decreased for meat cooked at 200°F. as cooking time increased for a certain period, then increased sharply. The time required for the increase to begin was greater than that necessary for roasting at the higher oven temperatures. Since the increased trim loss was due mainly to crumbling, the conversion of collagen to gelatin may be affected more by the time in the oven than the final internal temperature. The comparatively low yield from the well done meat roasted at 200°F. may be partially explained on this basis.

Evaporation losses increased with time in a straight-line fashion for roasts cooked in the 225° and 250°F. ovens. In the 200°F. oven, the rate of increase in loss was greater during the first part

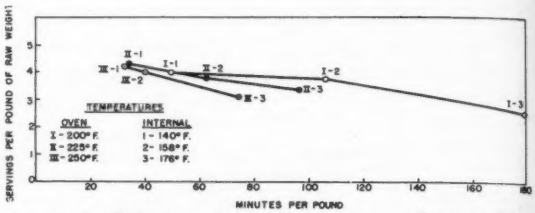

FIG. 3. *Relation of servings per pound to cooking time of 10-lb., U.S. Choice grade pieces of top round of beef roasted to three degrees of doneness at three oven temperatures*

of the cooking period than during the latter. Juice loss decreased as cooking time increased. Drip losses increased with length of time in the oven, but the rate varied with oven temperature. In the 200°F. oven, the increase was in a straight-line fashion; in the 225°F., the rate decreased slightly as cooking time lengthened; in the 250°F. oven, the loss increased rapidly during the early part of the cooking period.

PALATABILITY

Samples were scored for appearance, tenderness, juiciness, and flavor by a six-member taste panel. Due to the differences in cooking times and the difficulty in estimating the time at which roasts would be done, it was not always possible to prepare samples when judges were available. The results, based on limited observations, indicate that top round should be acceptable as roast beef.

The appearance tended to be scored lower as the degree of doneness increased, possibly due to the relatively drier appearance and the ragged edges. The roasts cooked to well done developed a hard crust which was difficult to cut, causing the meat to tear during slicing. Tenderness increased as internal temperature increased while juiciness decreased. Flavor scores were similar at all degrees of doneness. No consistent trends in palatability scores due to oven temperature were evident.

COMPARISONS WITH PREVIOUS WORK

An earlier report dealt with the effect of size of roast and internal temperature on losses, yield, and cooking time. In that study, 5-, 10- and 15-lb. roasts were cooked to five internal temperatures (140°F., 149°F., 158°F., 167°F., and 176°F.) in a 300°F. oven. The findings for the 10-lb. roasts cooked to 140°F., 158°F., and 176°F. were compared with those obtained previously. For meat roasted in a 300°F. oven, juice losses were higher, but other losses tended to be lower than for that roasted at 200°F., 225°F., and 250°F. Since juice loss is a small proportion of the total losses, the result is a significant reduction in total losses at an oven temperature of 300°F., when compared with those used in the present study. This reduction in losses is reflected in the higher yield as shown in Figure 3.

SMALL ROAST STUDY

The possibility that losses would be reduced with the shorter cooking time required for roasts weighing less than 10 lb. was considered. As an exploratory study, 5-lb. pieces of Choice grade, top round of beef were roasted to 176°F. internal temperature. Four roasts were cooked at each of the three oven temperatures. The percentages for losses were higher and yield per pound raw weight was lower than for the 10-lb. roasts cooked at the corresponding temperatures.

The average cooking times for the smaller roasts were reduced somewhat, but not in proportion to the reduction in size. In fact, some of them required a longer cooking time than some 10-lb. roasts at the same oven temperature.

Summary and Conclusions

Eight replications of 10-lb. pieces of Choice grade, top round of beef were roasted to three internal temperatures (140°F., 158°F., and 176°F.) at three oven temperatures (200°F., 225°F., and 250°F.). Preparation losses, cooking time, and yield were compared on the basis of internal temperatures and oven temperatures. Limited work was done on palatability.

Based on observations made within this study it may be concluded that:

(a) Evaporation losses varied with oven temperature and increased with internal temperature in low-temperature roasting of beef.

(b) Drip losses increased as oven temperature and internal temperature of the meat increased.

(c) Trim and juice losses decreased as internal temperature and oven temperature increased.

(d) Total losses were greatest in the 200°F., oven, and at all oven temperatures there was greater loss at the higher internal temperatures.

(e) The yield (4.3 servings per pound raw meat) was largest from roasts cooked at 225°F. to 140°F. internal temperature.

(f) Length of time and variability in total time appears to be a major problem in low-temperature roasting and makes these temperatures impractical.

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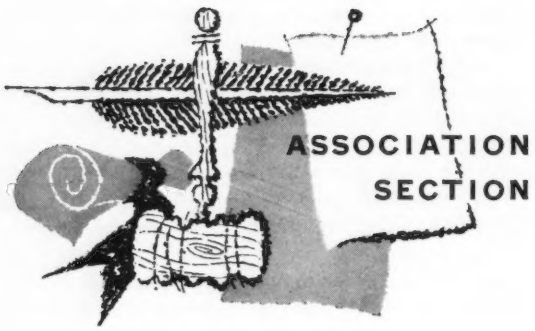
Cooperative Regional Research in Institution Administration

Cooperative regional research in institution administration has been a recent development. In January 1955, because of a recognition of the need for research in food administration in institutions, a meeting was planned by representatives of the Home Economics Research Administrators of the North Central Region. Institution management representatives from the agricultural experiment stations of Illinois, Iowa, Kansas, Michigan, Ohio, and Wisconsin discussed research problems and initiated plans for cooperative regional research. After a meeting to develop the master plan for the research, the NC-31 Technical Committee was organized in June 1956. The title of the approved project was the "Effect of Large Quantity Preparation and Service on Quality and Yield of Meat, Poultry and Vegetables." This was revised in November 1957 to add milk and milk products to the groups of food to be studied. The objectives of the research are to: investigate procedures which affect quality and yield, ascertain methods of quantity food preparation and service which will improve palatability and minimize waste; formulate recommendations for standard procedures in the quantity preparation and service of quality foods.

Projects have been approved and research is in progress for the study of preparation of beef at Ohio State and Kansas State Universities, pork at Purdue University, poultry at Iowa State University, potatoes at the University of Wisconsin, and milk products at the University of Illinois. The NC-31 Committee, which includes institution management representatives from the agricultural experiment stations in the North Central Region, meets regularly to report progress, evaluate results, and plan for future research. —*Excerpted from "Research in Institution Administration" by Beatrice Donaldson. J. Home Econ. 51: 849, 1959.*



Food Protection Committee Meeting

—Washington, D. C., December 8 and 9, 1959

MARGARET A. OHLSON, Ph.D.[1]

Director, Department of Nutrition,
University Hospitals,
State University of Iowa, Iowa City

THE DEVELOPMENT of industry following two world wars has had a tremendous impact on the production processing, preservation, storage, and distribution of food. Farming has become mechanized, and the diversification of crops characteristic of the early part of the century has almost disappeared. Among the many changes attendant on the development of the single-crop farming is dependence on the chemical industry for fertilization, insecticides, and pesticides, and the treatment and packaging of crops to be shipped long distances to market. Hundreds of new chemicals have been and are being developed and put into use. Since the safety of these products when present as additives or residues in human food is all too frequently unknown, these developments are of concern to all dietitians who must make the decisions for the purchase or rejection of food.

What the Committee Is and Does

The formation and development of the Food Protection Committee, a committee of the Food and Nutrition Board of the National Research Council, National Academy of Sciences, is best described by the following quotation taken from the January 1959 pamphlet (1) which describes the organization, membership, and publications of this group.

> At the end of the war, the Food and Drug Administration resumed hearings for the definitions and standards of identity for foods. In the course of the hearings the increased use of chemicals in food products was emphasized. For example, the hearings on bread were greatly prolonged because certain new chemical agents being used in bread were contested as admissible ingredients by competing industries. Public attention was directed even more strongly to the new developments when a House of Representatives Select Committee undertook to investigate the use of chemicals in foods.
>
> Prompted by these developments and at the request of an organizing industry committee, the National Research Council established the Food Protection Committee as a committee of the Food and Nutrition Board to serve as a fact-finding and advisory body for government and industry. Financial support from food, packaging, and chemical industries, commercial laboratories, and individuals provides funds for a secretarial staff and for meetings of the committee. The members serve without compensation.

In addition to the Food Protection Committee and its four subcommittees, a liaison panel was formed consisting of representatives of contributing industries, commercial laboratories and consultants, trade associations and foundations, governmental agencies, and scientific and technical societies. Industry has appointed a small governing committee. Thus, more than two hundred persons contribute in some way to the activities of this group.

The work of the Food Protection Committee has been impressive. Between September 1950 and January 1959, thirteen pamphlets have been published dealing with the safety of a large number of products proposed for use as chemical additives and with the principles and procedures for evaluating new products. Each January a small pamphlet describing the activities and membership of the committee is published.

At the December 1959 meeting, manuscripts for two new publications which have been approved for late winter publication were distributed. These are *Principles and Procedures for Evaluating the Safety of Food Additives* (2) and *Problems in the Evaluation of Carcinogenic Hazard from Use of Food Additives* (3). Members of the Association may obtain copies of these materials at a minimum cost by writing Dr. Paul E. Johnson, Executive Secretary, Food Protection Committee, 2101 Constitution Avenue, Washington 25, D.C.

The 1959 meeting of the full Committee, including liaison members, which was held in December, was concerned with the future work of the committee, its legal and governmental relationships, and the terminology used in reports. It was pointed out, for instance, that certain words used in the committee publications do not conform to legal definitions. Since the Committee is concerned with principles and not tolerances for use of chemical additives, this was conceded to be unimportant. The Committee has used the terminology of international organizations. A full report of Committee objectives and proposed work for the coming year may be obtained from the above address by requesting a copy of the January 1960 report.

[1]Dr. Ohlson attended this meeting and reports on it as the official representative of The American Dietetic Association.

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Problems of Carcinogenicity

The second day of the meeting was devoted to a consideration of special problems in the toxicology of food additives with emphasis on carcinogenicity. It was pointed out that all direct evidence of carcinogenicity is based on studies with animals, the laboratory rat or mouse and the dog being species most generally used. There are species differences in susceptibility to chemicals. These may be real differences; for instance, sugar used as a preservative is lethal to certain forms of life, or differences related to the life span of the animal.

Some hold the view that there is no such thing as a threshold dose of a true carcinogen, but the induction period before disease is manifest may be longer than the life of the animal and in general, is increased as the dosage decreases; thus, in effect, establishing a threshold. At this time, there is no basis for evaluation of a carcinogen threshold in man for any compound, although it is presumed that such thresholds exist. Man has the capacity to handle many known toxic substances when the daily intake is below a critical amount. If a chemical is capable of conjugation, the potential toxicity may be inferred to be less. Moreover, risk is a part of living; the problem is one of evaluation of degree.

Other Problems of Toxicity

Other problems in evaluating risk of toxicity to man in the use of additives is the possibility of interaction with the food, exemplified by the browning reaction resulting from the mixture of ascorbic acid and sugar which reduces the nutritive value of both compounds, or of an interference with the usual rate of intestinal synthesis of a nutrient. Little is known of such problems.

One interesting session was devoted to an evaluation of techniques for testing toxicity. At present, animal studies continued for the life span of the rat or mouse and four years for a dog are recommended. Sufficient numbers of animals to insure adequate controls must be used, and the plan of the experiment must preclude personal bias in the interpretation of results. All tissues of the animals must be examined. Such tests are both expensive and time-consuming and, of course, delay the release for use of a chemical which could be entirely innocuous and very useful.

Experiments are being done with the use of tracer techniques and certain easily obtained physiologic measures. Also, the use of other species, such as insects and chick embryos, is being explored, but such data are not useful for extrapolation to the human being at this time. As our knowledge of the field of food additives develops, it is probable that a different technique may be required for each class of compounds.

It should be emphasized that the problem of food additives should not be approached by the dietitian from the point of view of fear of toxicity, nor should all additives be condemned. Many are safe, others are safe when properly used, and our modern, diversified food supply would not be possible without them. It is an obligation of the dietitian to have an understanding of the basic nature of these problems and to keep abreast of sources of information of sound fact. The Food Protection Committee is to be commended for its sane and fundamental approach to many difficult problems.

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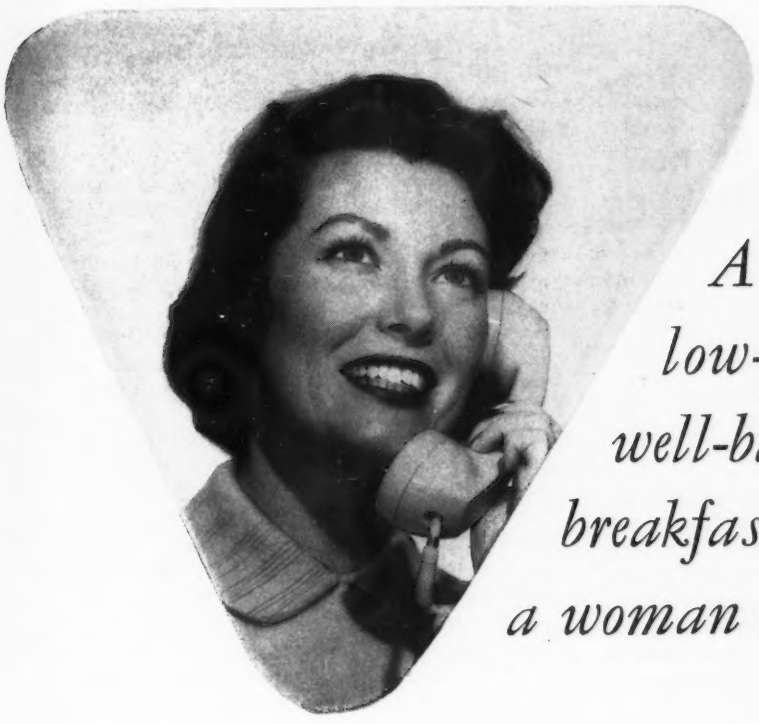
(3) Food Protection Comm.: Problems in the Evaluation of Carcinogenic Hazard from Use of Food Additives. Washington, D.C.: Natl. Acad. Sci. —Natl. Research Council, in press.

Plasticized Margarines

There are now three plasticized margarines containing approximately 65 per cent unhydrogenated oils (Swift's VSF, Pitman-Moore's Emdee, and Best Foods' Cornette). Obviously such margarines must be especially processed to give the product a sufficiently high melting point to permit shape retention. These margarines are blended or plasticized with a suitable, more solid fat. They generally contain about 15 per cent hydrogenated and 65 per cent unhydrogenated oils. The hardened fat portion may be hydrogenated coconut oil, cotton seed oil, corn oil, soybean oil, or blends. The net result is a spread containing a high proportion of linoleic acid. Another margarine, made entirely from hydrogenated corn oil, is promoted as offering the same benefits. However, this margarine contains no more linoleic acid than conventional margarines and the claims made for it have not been documented.—*Excerpted from "Dietary Fads in Heart Disease" by Philip L. White in* Illinois Medical Journal *116:308, 1959.*



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Cereal, dry weight—1 oz.;
Whole Milk—4 oz.; Sugar—1 teaspoon;
Toast (white, enriched)—2 slices;
Butter—5 gm. (about 1 teaspoon);
Nonfat Milk—8 oz.

Nutrients	Calories	Protein	Calcium	Iron	Vitamin A	Thiamine	Riboflavin	Niacin equiv.	Ascorbic Acid
Totals supplied by Basic Breakfast	503	20.9 gm.	0.532 gm.	2.7 mg.	588 I.U.	0.46 mg.	0.80 mg.	7.36 mg.	65.5 mg.
Recommended Dietary Allowances—Women, 45 Years (58 kg.—128 lb.)	2200	58 gm.	0.8 gm.	12 mg.	5000 I.U.	1.1 mg.	1.5 mg.	17 mg.	70 mg.
Percentage Contributed by Basic Breakfast	22.9%	36.0%	66.5%	22.5%	11.8%	41.8%	53.3%	43.3%	93.6%

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Watt, B. K., and Merrill, A. L.: Composition of Foods—Raw, Processed, Prepared. U.S.D.A. Agriculture Handbook No. 8, 1950.

**The allowance levels are intended to cover individual variations among most normal persons as they live in the United States under usual environmental stresses. Calorie allowances apply to individuals usually engaged in moderate physical activity. For office workers or others in sedentary occupations they are excessive. Adjustments must be made for variations in body size, age, physical activity, and environmental temperature.*

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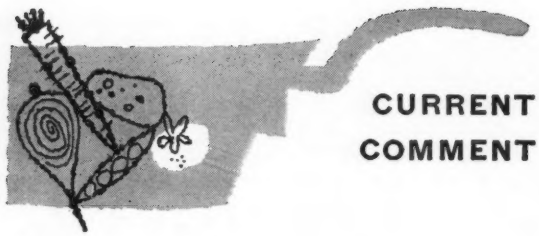

CURRENT COMMENT

Training for the Profession of Dietetics[1]

JOHN S. LUNDY, M.D.
Mayo Clinic,
Rochester, Minnesota

DR. RUSSELL M. WILDER established the fact that dietetics is a profession (1). I accept this statement. In general, my remarks will be concerned with education in preparation for the profession of dietetics.

I wish to emphasize the need for advancement and improvement in education for the profession of dietetics, for I have a special interest in this important new field. My daughter, at my urging, has become a dietitian, and has now qualified herself for the degree of Master of Science in Nutrition from the University of Minnesota and the Mayo Foundation.

You, who now constitute the twenty-ninth graduating class to complete the dietetic internship at St. Marys Hospital, have opportunities today for advanced education which have not always been available. I can speak with some experience on the question of opportunity for advanced training in a special field, for when I was a young man about to enter anesthesiology, graduate work in that young specialty did not exist. I did not have a textbook of anesthesiology to read; I had to write the book (2).

You are faced with no such problem. Much of the knowledge you need is available and more is coming to hand constantly. However, to make this knowledge useful, it is necessary to become as familiar with it as possible so that it can be applied to greatest advantage. A precise working knowledge does not come easily, nor is it sufficient to be learned in a field without the ability to convert that learning into useful action. To achieve skill, one must devote much effort to mastery of the subject. Great musicians spend endless hours in physical effort to accomplish their objective, and after many years of such tedious devotion, they are in a position to teach others the skill they have acquired. The way is slow indeed, but it is the only way that sound progress is made. There are no short cuts to success. Success is not an accident or a matter of luck. What seems to be luck more often than not turns out to be simply another application of an aphorism I read once: "Luck is what happens when preparation meets opportunity."

History will certainly repeat itself in that, as people become more and more civilized and more numerous, competition will become keener and keener. Higher and higher standards are developed in every field of endeavor, and only the proficient, informed, and industrious will attain such standards. Higher standards are inevitable in dietetics. The courses now offered for dietitians in colleges, universities, and internships will be improved, but they cannot very well be greatly expanded, so far as time is concerned. Yet to shorten these courses is to invite disaster in the long run. It may take a little while, but the inadequately trained dietetic graduate will leave an inferior record. In time, short courses will be considered intolerable. The answer, of course, is more intensified teaching and study. Fortunately for you, graduate courses are available which can lead to advanced degrees in nutrition.

I am told that of the 14,000 members of The American Dietetic Association, only 14 per cent have the degree of Master of Science in Nutrition, and that only 1.4 per cent hold the degree of Doctor of Philosophy. It is easy to see that progress has been made, but the percentage of persons who hold advanced degrees in nutrition is still too small to accomplish what needs to be done. All of you have had help in obtaining your training as dietitians. The great need of your profession at the moment is that as many as possible of you continue your education in graduate studies, so that more and more people may be trained by more and more highly qualified instructors. The time is not far distant when the demand for the highly qualified dietitian will be acute. This demand will, inevitably, be reflected in increasingly larger remuneration for the effort that has been expended.

Let us admit that currently there is a scarcity of dietitians, but let us not propose to meet the problem by sacrificing quality to obtain quantity. It has always been true in any of the professions that one superior person can achieve brilliant results; on the other hand, the number of poorly prepared, indifferent, inefficient persons who fail uniformly is always inestimably greater.

My experience in helping to set standards in my own special field has allowed me to observe that even after an examining agency with the highest standards has been created to accredit a man as proficient enough to be judged a specialist, within a short time a process of stratification becomes evident. That is, as the number of accredited specialists increases, a small group of the most highly skilled and accomplished of these specialists rise to the top. At the lowest stratum is a large number of persons who have been barely able to qualify. In

[1]Presented before the graduating class of dietetic interns of St. Marys Hospital, Rochester, Minnesota, on July 8, 1959.

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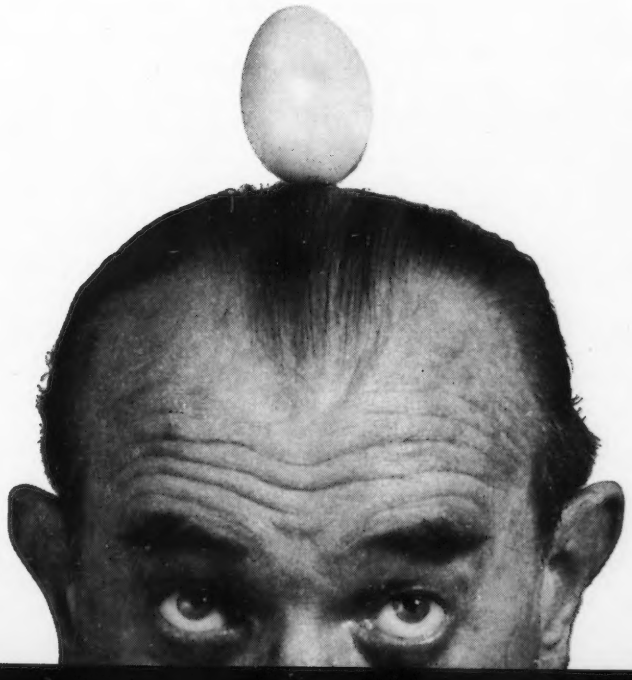


between are the majority, who collectively are what is known as the "average specialist." Yet all of these persons, in all three strata, are very much better equipped for their profession because of the application, study, and experience required of them to satisfy the requirements which had been so carefully planned.

In the field of dietetics, the same situation will occur. That is, a considerable number of persons will become highly qualified, and they in turn will exert a stimulating influence on the advancement of the profession, so that dietetics, too, will join the lists of other professions which started in emulation of the learned churchmen of long ago. Dr. Wilder pointed out that, due to this religious influence, we speak of a profession as a "calling," the notion conveyed by this word being that those in professions serve mankind more nearly selflessly than does the average lay person.

I am sure that some time in the future each state will create a licensing board for dietitians and that higher standards of education will be in effect for dietitians than those existing now. Such a sequence of progress is a natural development for any profession, whether it be the medical, dental, legal, or any other field.

Implications of Scientific Developments

The need for higher education among people is a compelling thing. Notice, if you will, the influence exerted by the work of Russian scientists in their successful attempts to send objects into orbit. Results of these experiments caused much commotion in our country, and almost immediately great emphasis was placed on the teaching of science in our schools. Today, the progress of man in matters of science has carried him to a point at which he cannot turn back. A few of the unenlightened will try to reverse the tide, but their efforts cannot prevail.

Confronted with the problems of existence in the face of new knowledge about space, no one can escape a share of the burden of preservation of the nation. How will living things be put into orbit in space unless they can be nourished and kept alive? If the latter cannot be done, the project will fail, for only a man adequately maintained in space will satisfy the requirements of the scientists. Adequate maintenance will require very advanced knowledge of biochemistry and physics. The preparation and packaging of food for such expeditions will require great skill. Better methods of ingesting food will need to be developed. Certain problems in biochemistry which are relatively complicated today probably will be learned fundamentally in the future, in early lessons rather than during the process of the advanced education of today. Hence, you live in a day of opportunity, and I suggest that you prepare yourself to meet the exactions which opportunity claims.

You may be faced with a problem in the matter of obtaining advanced training because of a number of sacrifices which higher education demands. I should like to make the point that you can succeed only if you have an indomitable will to succeed. Not long ago a friend sent me a quotation from what I believe was an engineering magazine. Although I do not know its specific source, I pass it on to you, as apropos of the thesis of this talk:

"The price of success is . . . to use all your courage to force yourself to concentrate on the problem in hand; to think of it deeply and constantly; to study it from all angles; to plan ahead.

"To have a high and sustained determination to achieve what you plan to accomplish, not only when conditions are favorable to its accomplishment, but in spite of all adverse circumstances which may arise.

"To refuse to believe that there are any circumstances sufficiently strong to defeat you in the accomplishment of your purpose.

"Hard?? Of course, that's why so many men never reach for success, yield instead to the siren call of the rut and remain on beaten paths that are for mediocre men. Nothing of note has ever been achieved without constant endeavor, some pain, and ceaseless application of the lash of ambition.

"This is the price of success. Charles F. Kettering was willing to pay this price."

I wish you success.

References

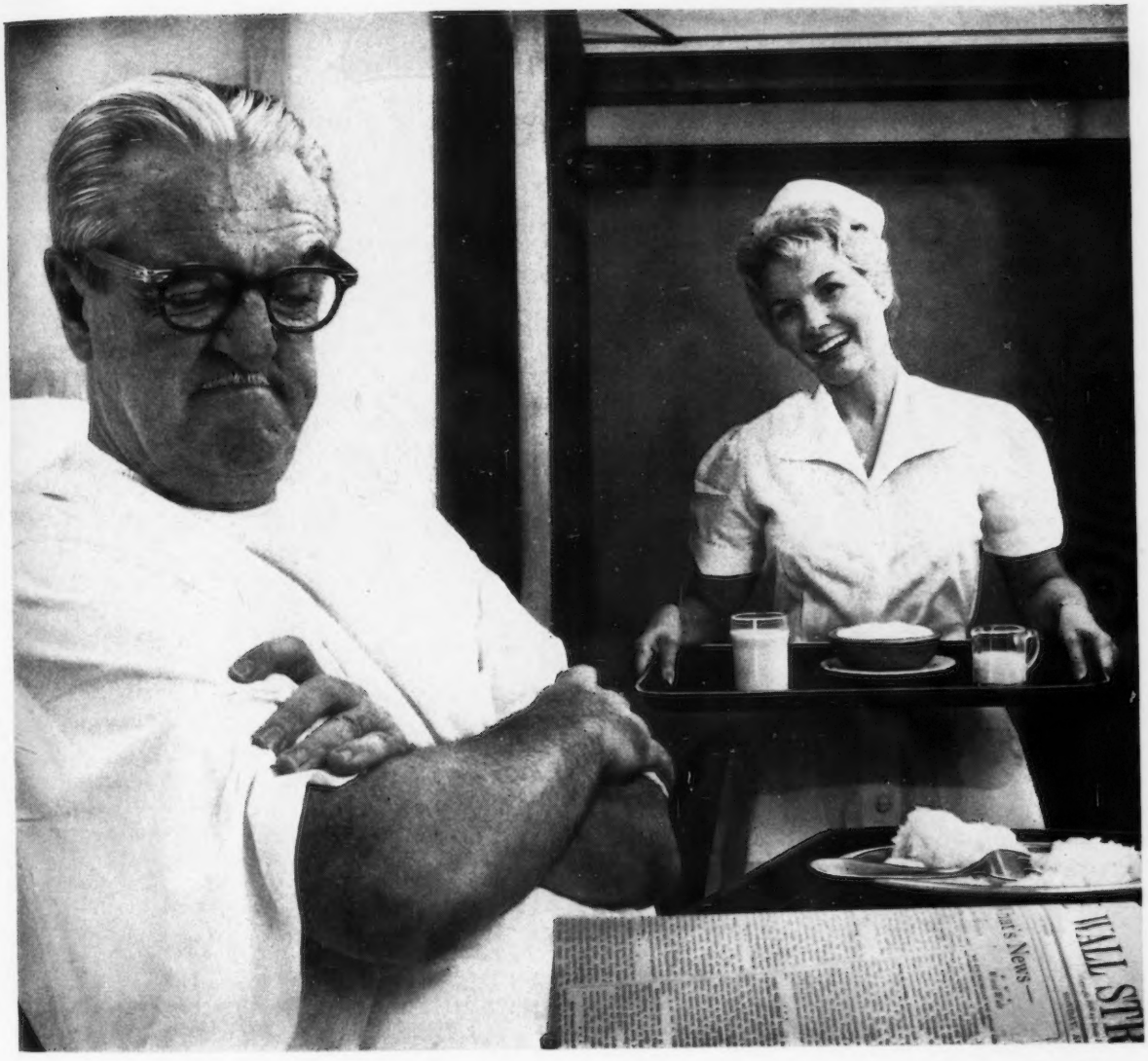
(1) WILDER, R. M.: The profession of dietetics. J. Am. Dietet. A. 26: 497, 1950.

(2) LUNDY, J. S.: Clinical Anesthesia: A Manual of Clinical Anesthesiology. Philadelphia: W. B. Saunders Company, 1942.

Post-Internship Masters' Degree Programs in Hospital Dietetics

THE PROGRAMS described below have been specially developed for the hospital dietitian. There are many additional opportunities for graduate study in foods and nutrition, institution management, and other areas of interest to the dietitians. Financial assistance is available through graduate assistantships, fellowships, and scholarships for those wishing to pursue advanced educational work.

An appreciable number of dietetic internships also offer opportunity for graduate study concurrent with the internship. If a master's degree is desired, however, the time required for a program of this



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type is longer than the usual twelve-month internship period. The current listing of dietetic internships approved by The American Dietetic Association includes details of these programs.—*Wilma F. Robinson, Dietetic Internship Liaison Director, The American Dietetic Association.*

The Ohio State University Program[1]

A twelve-month residency in nutrition leading to the degree of Master of Science and a certificate of residency is offered at The Ohio State University, Columbus. This residency, in effect since 1954, is sponsored by the Department of Preventive Medicine, College of Medicine, and the School of Home Economics.

It is designed to meet the needs and interests of dietitians, nutritionists, and others interested in nutrition or dietetics. Excellent and convenient facilities are available to the resident through the University Hospital and on the University campus, both of which are located in close proximity. The resident may elect classes from any college or school on campus. Emphasis on course work may be placed in one or more of several areas:

(a) *Nutrition*—with courses available in advanced biochemistry, nutrition and intermediary metabolism, bacteriology, advanced physiology, preventive medicine, and statistics.

(b) *Food service administration*—with courses in personnel management, advanced business organization, food cost analysis, and sanitation.

(c) *Education*—with courses in guidance, counseling, adult education, group methods of instruction, and educational philosophy.

(d) *Combination curricula*—with courses from all areas.

Approximately 10 to 15 hr. of the 45 hr. required for the degree of Master of Science are devoted to research and the writing of a thesis. Again, the research may be completed in the specific area of the resident's interest.

A specialized hospital learning experience is scheduled to strengthen the resident's knowledge and experiences in the chosen area. Residents are available for dietary consultations and attend and participate in doctors' ward rounds, grand rounds, and seminars. Experience may be obtained in the food service administrative areas of the dietary department. Approximately 12 to 15 hr. per week are devoted to the specialized experience in the hospital, the teaching of medical students, nursing students, dietetic interns, or home economics students.

Applicants for the residency program must have a bachelor's degree, be a member of The American Dietetic Association, or otherwise show eligibility for advanced work in nutrition or dietetics. They must also be eligible for admission to the Graduate School. Four to six residents may be appointed each year. Appointments are usually made in March or April for admission July 1. The resident receives a stipend of $175 per month. All fees, including out-of-state fees, are waived, except for a matriculation fee of $15 and a thesis binding fee of $14.

The residency is specifically designed to meet the growing needs for advanced education of dietitians in all phases of dietetics and nutrition.—*Joan L. Sharp, Education Director, The Health Center, The Ohio State University, Columbus.*

Veterans Administration Programs[2]

The need to meet the challenges to the profession of dietetics through new types of educational programs or new emphases in those already existing is well recognized. The residency program of the Veterans Administration is one of several emerging as a response to this need. It provides, as the other programs do, a longer period of training with emphasis on a specialty. The goals of the program are: to develop specialized knowledge and to provide experience in the field of specialization beyond that possible during the year of the general rotating internship.

In the Veterans Administration, the "dietetic residency"—the title which identifies the post-internship position—is one year in length. It is available to dietetic interns in the Veterans Administration internships or to dietitians working in Veterans Administration hospitals and clinics. Five residencies are available as follows:

VETERANS ADMINISTRATION HOSPITAL, BRONX, NEW YORK, with graduate work in institution administration at Teachers College, Columbia University

VETERANS ADMINISTRATION HOSPITAL, IOWA CITY, IOWA, with graduate work in nutrition, with specialization in experimental nutrition or administrative problems at the State University of Iowa

VETERANS ADMINISTRATION CENTER, LOS ANGELES, with graduate work in nutrition research at the University of California in Los Angeles

VETERANS ADMINISTRATION HOSPITAL, MADISON, WISCONSIN, with graduate work in foods and nutrition at the University of Wisconsin

VETERANS ADMINISTRATION HOSPITAL, SYRACUSE, NEW YORK, with graduate work in foods and nutrition at Syracuse University

[1]Presented at the Conference of Faculties of College and University Home Economics Departments and Approved Dietetic Internships at the 42nd Annual Meeting of The American Dietetic Association in Los Angeles, on August 27, 1959.

[2]Presented at the Conference of Faculties of College and University Home Economics Departments and Approved Dietetic Internships at the 42nd Annual Meeting of The American Dietetic Association in Los Angeles, on August 27, 1959.

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The dietetic residency is a year of combined academic and professional training. Beginning dates coincide with the academic programs established in the universities, and admission is through the respective graduate school. The resident is assigned to a Veterans Administration hospital 20 hr. a week performing dietetic duties in the area related to the academic major she has selected. She attends graduate classes to satisfy the requirements for a degree of Master of Science or Master of Arts.

Salary for dietetic residents is prorated on the basis of $4980 per annum, depending on the number of hours worked in the hospital. Residents provide their own uniforms, for which they receive an allowance and laundry at government expense.—*Gertrude E. Miller, Instructor in Dietetics, Veterans Administration Center, Los Angeles.*

Fellowships in Nutrition at Mayo Foundation

The Mayo Foundation, a division of the Graduate School of the University of Minnesota, annually offers two fellowships for training in nutrition in Rochester, Minnesota. These fellowships are open to qualified holders of bachelor's degrees who have completed approved internships in hospital dietetics. Appointments are made quarterly, with fellowships commencing at the start of university quarters, namely, January, April, July, and October. Supervision is by the Mayo Foundation faculty in medicine, physiology, and biochemistry. The clinical, laboratory and research facilities of the Mayo Foundation, the Mayo Clinic, and St. Marys Hospital are employed for training and research.

During the fellowship program in Rochester, fellows are enrolled as graduate students of the University of Minnesota and may earn 26 graduate credits. The fellowship carries a stipend of $3300. The fellowships are intended to provide opportunities that will aid fellows to qualify as research dietitians and for teaching positions in medical centers.

The fellow's one-year program in Rochester has considerable flexibility and is planned individually with the candidate. However, it usually is arranged to include the following:

(a) *Human metabolic studies in various diseases* (one quarter or 4 credits). The fellow usually spends the first three months in the metabolic unit, where she is given opportunity to learn dietary principles and techniques employed in conducting research studies of a metabolic or nutritional nature. Some of the investigations are balance studies. She is further afforded experience and responsibility, at first under supervision, of planning and executing such studies. Work in this unit is under the supervision of the departments of medicine and physiology. Experience is supplemented by conferences and group discussions.

(b) *Advanced diet therapy with clinical experience* (one quarter or 4 credits). Generally, three months of the fellowship are devoted to experience in clinical dietetics. During this time, the fellow makes daily hospital rounds with the medical staff, plans modified diets for various diseases, and is responsible for the dietary care of patients on one clinical service. This period is under the supervision of a section of medicine and the department of dietetics, St. Marys Hospital. Experience is supplemented by lectures and conferences.

(c) *Research on problems concerned with nutrition or metabolism* (two quarters, or 18 credits for thesis). The fellow carries out an individual or collaborative research project concerned with a physiologic, metabolic, or nutritional problem. This research study usually forms the basis for a thesis.

Following completion of the fellowship program in Rochester, the candidate for an advanced degree must register for study at the University in Minneapolis and St. Paul. She must take additional courses to complete a minimum of 18 quarter credits in the major field and 9 in the minor. The minor subject usually chosen is education, biochemistry, physiology, or economics.—*Sister Mary Victor, Director, Department of Dietetics, St. Marys Hospital, Rochester, Minnesota.*

"Built-In" Sources of Strain for Patients

A potential source of tension between the hospital patient and the hospital staff, according to George G. Readers, M.D., and Mary E. W. Goss, of The New York Hospital—Cornell Medical Center, is "the disparity between training for medical service roles and training for the patient-role. When people first enter a hospital as patients, they have rarely been explicitly informed about hospital rules or professional norms for their conduct; frequently they have only a vague idea of what to expect or of what is expected of them. Hospital staff members, in contrast, have quite distinct expectations. Although they may be willing to teach patients what to do in order to fulfill these expectations, they also anticipate conformity. Patients, however, may for various reasons be unable or unwilling to learn or conform, so that the stage is set for discord."—*Excerpted from: Transactions of the Fourth World Congress of Sociology 3: 139, 1959.*

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APPROXIMATE ANALYSIS

PROTEIN	ASH	FAT (ETHER EXTRACTION)	CARBOHY-DRATES	TOTAL SOLIDS		CALORIES per 100 grams	CALORIES per 6 fl. oz. serving	SODIUM (Na) in Milligrams per 100 grams	SODIUM (Na) per 6 fl. oz. serving
0.47%	0.34%	0.02%	0.57%	1.40%	Dietetic Mushroom Broth	4.45	8.01	5.63 mg.	10.13 mg.
2.44	0.33	0.06	0.51	3.34	Dietetic Beef Style Broth	12.65	23.40	31.60	58.46
0.89	0.70	0.02	3.10	4.73	Dietetic Vegetable Broth	16.55	30.61	38.42	71.08
1.67	0.42	0.17	5.52	7.82	Dietetic Green Pea Broth	31.06	57.77	15.61	29.02
0.92	0.64	0.10	4.95	6.72	Dietetic Tomato Broth	25.00	46.50	24.74	46.02
1.34	0.38	0.03	0.26	2.01	Dietetic Chicken Broth	6.80	12.65	22.00	40.70

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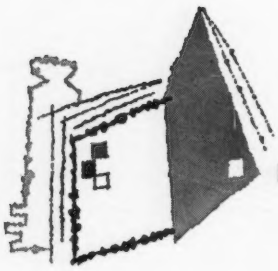

BOOK REVIEWS

Eat Fat and Grow Slim. By Richard Mackarness. Garden City, New York: Doubleday & Company, Inc., 1959. Cloth. Pp. 165. Price $2.95.

This book is a treatise for the concept that weight can be lost on a diet consisting primarily of fat meat or its equivalent in protein and fat derived from other animal foods. This, of course, is true and has been demonstrated on numerous occasions, many of which are quoted by the author. However, each investigator who rediscovers this weight-reducing routine seems compelled to provide an explanation for its effectiveness based on some obscure metabolic abnormality of the obese which is supposed to be aggravated by the inclusion of carbohydrate in the diet and which disappears when 80 per cent of the day's calories are derived from fat.

Another fallacy, developed at length, is that because the obese body is thought to be able to metabolize fat but not carbohydrate, an unlimited amount of food may be eaten as long as carbohydrate is restricted to a few grams a day in the form of vegetables and fruits, and fat and protein are eaten in the ratio of four to one, computed as calories. The fact that the personnel of two competent laboratories in this country have demonstrated that this diet has high satiety value, that the subject reduces his caloric intake to the amount he can eat, and that this is regularly less than the calories required for weight maintenance in a fat person, is not considered. That the law of conservation of energy applies in this case and weight is lost in direct relation to the caloric deficit imposed, just as in any other successful routine, is prosaic and does not make good propaganda for the sale of books, but is nevertheless comforting to those of us who still believe that nutrition is an exact science.

The argument for the inability of the fat person to metabolize carbohydrates is that there is a metabolic defect in the breakdown of carbohydrate to pyruvic acid. This is presented by means of a series of clever action drawings, but without any further proof that the situation actually occurs. Such a defect could occur, but if it does, it should also be capable of demonstration and, to date, such a demonstration has not been reported.

Thus we are presented with still another book on diet based on a minimum of fact but supported by many chapters of what can only be described as propaganda based on a badly digested series of half truths and some outright error. For instance, on page 53 the author indicates that 6 to 9 oz. lean meat and 2 to 3 oz. fat would be a "suitable" consumption, presumably per day. This would provide from 1200 to 1500 calories, an intake on which most adults would lose weight. However, on page 55, one finds the statement that 6 to 7 lb. lean beef and a pound of fat would be needed by a working man. Using the same calorie factors, this equals at least 10,000 calories per day, well above any proven need of the human body for sustained work output.

No one will disagree with the author that the food is palatable to an average American or Northern European. One does not become hungry between meals, and many problems of eating out are solved. Also, by the use of some milk and raw fruits and vegetables, which the author allows, there is no question that the diet can be made nutritionally adequate.

The wisdom of using a high-fat diet for weight reduction when cardiovascular pathology is present is, of course, unknown. It could be tragic if the decision were to be taken out of the hands of the attending doctor by the patient who reads a book of this sort, particularly a book written by a physician and with a foreword and introduction by physicians.—*Margaret A. Ohlson, Ph.D., Director, Department of Nutrition, University Hospitals, State University of Iowa, Iowa City.*

Principles of Nutrition. By Eva D. Wilson, Katherine H. Fisher, and Mary E. Fuqua. New York: John Wiley & Sons, Inc., 1959. Cloth. Pp. 483. Price $5.95.

This book, according to the authors, is designed to provide basic information in elementary nutrition particularly for college students. They assume no background in chemistry or physiology, yet draw on concepts from these two sciences and attempt to give the necessary background through a glossary, diagrammatic drawings, and a chapter devoted especially to definition of terms.

Principles are then related to the student's well-being, his dietary needs, and to needs of several special groups. Twenty-four chapters give up-to-date information. Among the subjects covered are: energy nutrients; need for energy; energy value of foods; digestion, absorption, and metabolism; the proteins; minerals; water and cellulose; fat-soluble vitamins; ascorbic acid; "B-complex" vitamins; selection of an adequate diet; dietary habits; nutritional status; food fads and fallacies; diet and dental health; and nutrition of children and special groups.

Through the use of the glossary and the bibliography for each chapter, the student has opportunity to do extensive investigation. Whether he will be so inspired depends, of course, on the teacher and the student's ability to understand with the limited science background. Though controversy on several topics is suggested, the subject is summarized so succinctly that the reader may not detect this controversy.

The organization of the book leads to considerable repetition, frequently with no reference to former explanations. Thus, some of the effectiveness of repetition may be lost with the beginning student, or it may become burdensome to the better-informed reader.

Many of the illustrations are animated. Thus several formulas for organic compounds show carbon-carbon, carbon-oxygen, and carbon-nitrogen linkages held in place with stick figures. Although the diagrams are cheery, it is often difficult to detect what is schematic and what is intended as literal representation. Some explanation along these lines would have helped.

This is an interesting, ambitious book which might have been more concise and self-contained had the authors assumed the student had at least high school courses in general science and in chemistry.—*Janice M. Smith, Ph.D., Head, Department of Home Economics, University of Illinois, Urbana.*

RECENT BOOKS RECEIVED

Modern Nutrition in Health and Disease—Dietotherapy. Second edition. Edited by Michael G. Wohl, M.D., and Robert S. Goodhart, M.D. Philadelphia: Lea & Febiger, 1960. Cloth. Pp. 1152. Price $18.50.

Hawaii Diet Manual. 3rd edition. Honolulu: Hawaii Dietetic Assn., 1959. Paper, spiral bound. Pp. 71.

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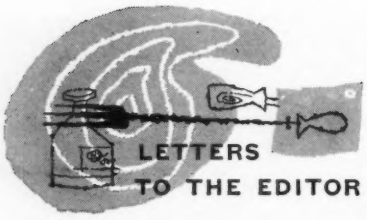

Our New Cover—Pros and One Con

TO THE EDITOR:

We like your new cover!—*Evelyn A. Carpenter, Director of Dietetics, Philadelphia General Hospital.*

TO THE EDITOR:

I think the cover design of the 1960 JOURNAL is just beautiful. The artist should be congratulated.—*Helen W. Flynn, University of Hawaii, Honolulu.*

TO THE EDITOR:

I like the color of the new JOURNAL. —*Esther Kiner, Community Hospital, Geneva, Illinois.*

TO THE EDITOR:

This year's cover color and layout are very attractive. As usual, the interior material is excellent—but the packaging is always important. You've done a fine job. Thank you!—*Connie Locher, Clark College, Dubuque, Iowa.*

TO THE EDITOR:

I would like to compliment you and your staff on the design of the JOURNAL cover. I think it is most attractive. —*Grace A. Miller, Quantity Food Research Laboratory, Michigan State University, East Lansing.*

TO THE EDITOR:

May I say that I was surprised at the "new look" of the JOURNAL. I like it!—*Marjorie M. Morrison, Regional Nutrition Consultant, U. S. Children's Bureau, Denver.*

TO THE EDITOR:

I think somebody should have prepared me for the startling change in the cover of the JOURNAL. It is always fun for things to have a new look, and I congratulate you on the success of the 1960 cover. I like the more complete listing of the articles on the front page. The January issue has wonderful material in it; it makes me proud of our Association of all those who work so faithfully for it.—*Elizabeth Neige Todhunter, Ph.D., Dean, School of Home Economics, University of Alabama, Tuscaloosa.*

TO THE EDITOR:

Congratulations on the attractive new "face" of our JOURNAL that carries the always-fine quality of between-cover material.—*Bessie Brooks West, Professor of Institutional Management, Kansas State University, Manhattan.*

TO THE EDITOR:

We are all so delighted with the new JOURNAL cover received in January. It is so very modern and outstanding in design and color.—*Esther G. Woodruff, Veterans Administration Hospital, West Haven, Connecticut.*

TO THE EDITOR:

I have heard many favorable remarks on the very eye-catching JOURNAL cover. You are certainly to be congratulated.—*Mary C. Zahasky, Director of Dietetics, University of Oklahoma Medical Center, Oklahoma City.*

TO THE EDITOR:

The new cover design for 1960 came as a bit of a shock and in the opinion of some of us here, not an improvement over the blue and white of previous years. I think the former cover design was much superior and easier to read. How about making the volume number larger type and omitting the vertical lines that make the printing so hard to read? It is seldom that I react to a new design with sufficient feeling to make a comment about it, but this one really disturbed me.—*Helen S. Mitchell, Ph.D., Dean, School of Home Economics, University of Massachusetts, Amherst.*

The Wheat-Oat-Rye-Free Diet

TO THE EDITOR:

A nutrition associate recently loaned me a copy of your November 1957 issue. I was especially interested in the article, "A Wheat-, Rye-, and Oat-Free Diet in the Treatment of Nontropical Sprue" by Sleisinger *et al.*

It occurred to me that you and the authors might be interested in my personal experience with the diet. Within 24 hr. of the time the physician at the nutrition clinic prescribed the diet, I felt some of my difficulties leave me. When I returned to the clinic a month later I had gained 7 lb. In one year, I regained 25 lb. I had lost, and now, at fifty years of age, weigh 130 to 135 lb.

At first, I used some of the recipes, but I now find it is easier just to omit wheat breads, cookies, and cakes. I eat corn from the cob or as a cornmeal cereal and use rice plain. I do like muffins made with soybean flour and potato starch as they seem easiest to prepare and the best tasting.

I doubt that I have added any knowledge about the diet. However, perhaps one more in the number of cases responding well to the diet will help the statistics.—*Alice Wooldridge, Supervisor of Public Health Nurses, Pittsburgh.*

Help for the Blind Person with Diabetes

TO THE EDITOR:

I find the A.D.A. project of translating the diabetes exchange lists into Braille most interesting and hope to be able to help with this work when I can become certified by the Library of Congress as a Braillist. It will provide a long-hoped-for opportunity of combining my two interests—dietetics and work for the blind.

Recordings for the blind are, of course, an excellent method of aiding the blind. However, this method would eliminate aid to a large group, including the retarded and the deaf-blind, whose only outside contact is by touch. For them, Braille is the *only* method of communication. In some cases, a combination of recordings and Braille transcriptions would be of inestimable value.

Recently a new recording called "Information for Blind Diabetics" has been released. It was compiled from publications of the American Diabetes Association and edited by the staff of the American Foundation for the Blind. It is an important step forward in helping the blind. Being in record form, however, it is only useful to those who have full sense of hearing and/or the facilities for playing the record. This recording may be borrowed from the regional libraries for the blind or purchased for $4 a set from the American Foundation for the Blind, 14 West 16th Street, New York, New York.

In this connection, dietitians may be interested in learning about a number of tools and aids which are available and useful to the blind homemaker. These, too, may be purchased from the American Foundation for the Blind.

Sunbeam frypan with Braille data on the control dial, so that temperatures can be set accurately. The metal cover is a convenience. Price—$15.60.

Mirromatic pressure cookers marked for touch-setting of pressures. In the electric model, temperature controls are also marked. Available in 4-qt. size, $10.75; 6-qt., $14.15; and 8-qt., $17.75. The electric model, in 4-qt. capacity, sells for $19.95. (Braille cooking charts are sent with all pressure cookers.)

Cake knife to enable homemaker to cut round cakes and place slices on a plate neatly. Price—$1.70.

Pie-cutting guide—assures six uniform slices from a 9-in. pie (sounds good for the sighted, too!). Price—$2.20.

Safety spoons—have hooks to allow them to hang on the edge of the kettle. Price—$1 per pair.

Teaspoon dispenser—gives exactly 1 tsp. sugar, coffee, detergent, and so on. Price—60 cents.—*Dorothy T. Mark, Coronado, California.*

EDITOR'S NOTE. The work of making dietetic materials available for the blind is progressing slowly. Up to this time, three A.D.A. publications have been hand-transcribed in Braille by the Division for the Blind, Library of Congress: *Meal Planning with Exchange Lists, Food Facts Talk Back,* and *Eating Is Fun.* These may be borrowed through any of the twenty-seven regional libraries for the blind throughout the country.

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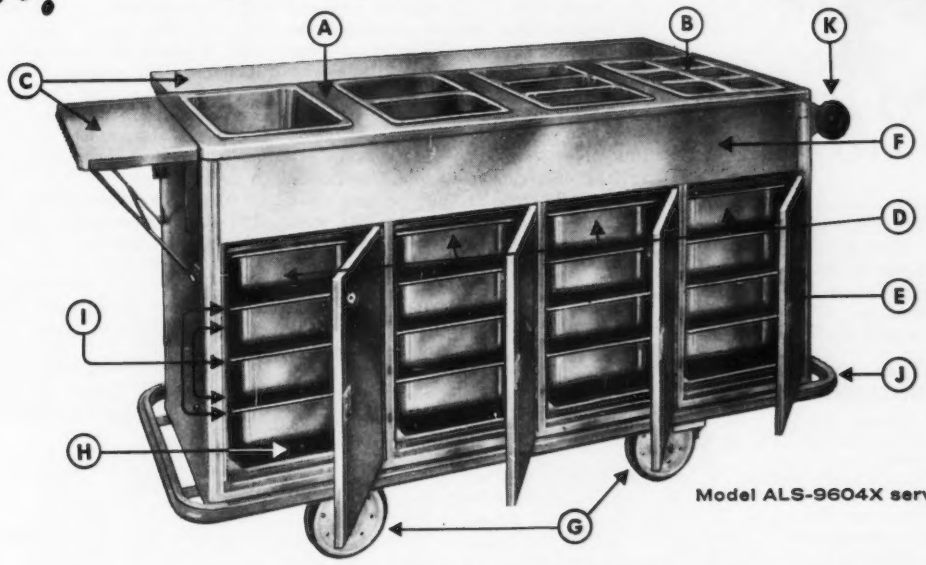

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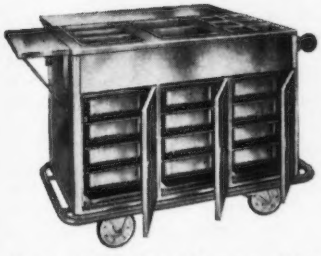

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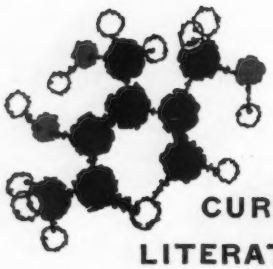

CURRENT LITERATURE

Contributed by Janette C. Carlsen, The Johns Hopkins Hospital, Baltimore; Clara Karl Frederick, University of Chicago Clinics; Elizabeth Tuft, Chicago Wesley Memorial Hospital; Margene A. Wagstaff, Elmhurst, Illinois, and the JOURNAL *staff.*

THE AMERICAN JOURNAL OF CLINICAL NUTRITION

Vol. 8, January-February 1960

SYMPOSIUM ON LIPID METABOLISM—L. W. Kinsell, guest editor.

*Blood coagulation and lipid metabolism. F. C. Monkhouse.—p. 1.

Lipid-induced coagulation changes in normal subjects and in patients with atherosclerosis. J. P. Dailey, E. A. Fullgrabe, R. L. Colescott, and Z. P. Tillotson.—p. 34.

*Freely extractable lipid of human blood plasma. I. Methodology and observations in normal and abnormal subjects. G. D. Michaels, P. Wheeler, A. Barcellini, and L. W. Kinsell.—p. 38.

*Effect of dietary fat on synthesis and degradation of cholesterol by the liver. D. Kritchevsky.—p. 53.

*Unsaturated fatty acids and plasma lipids. F. A. Kummerow, A. Ueno, T. Nishida, and M. Kokatnur.—p. 62.

*Arteriosclerosis — the lesion. R. L. Holman, H. C. McGill, J. P. Strong, and J. C. Greer. —p. 85.

*Dietary fat and plasma cholesterol. A speculative review. P. D. Klein.—p. 104.

Blood Coagulation and Lipid Metabolism. In this paper, blood coagulation is discussed in detail. The assumption that there is a relationship between blood clotting and thrombosis has led to an increasing number of studies on the role of fat in blood coagulation. It is unlikely that any changes in the coagulability of blood brought about by variations in the lipid level are important in the presence of a healthy endothelium or a normal blood flow rate. Such changes may be significant when superimposed on degenerative changes in the vessel wall or when circulation is impaired. The clinical importance of lipids on blood clotting can only be ascertained when there is a better knowledge of the relationship between blood clotting and vascular changes.

Lipid-Induced Coagulation Changes. The whole blood coagulation time following a lipid challenge was shortened in both normal subjects and patients with cerebrovascular disease. This effect was measured by a coagulation method of low inherent variability. The coagulation time curve had two depressions, one at 2 to 4 hr. and one at 6 to 8 hr. after the challenge. The shortened time at 2 to 4 hr. after ingestion of cream confirmed earlier studies. The drop in coagulation time at 6 to 8 hr. after the challenge corresponded to the time of maximum packing of red cells and decreased rate of circulation reported by Swank. This second shortening in coagulation time was greater in older patients than in the normal subjects. An isocaloric carbohydrate challenge to the normal group did not produce a similar alteration in coagulation time of whole blood.

Freely Extractable Lipid. The freely extractable lipid is that plasma lipid fraction which can be extracted with benzene under certain specified conditions. The freely extractable lipid level in fasting young normal males averages 47 mg. per 100 ml. Major deviations from normal occur in some patients with atherosclerosis and in all patients in a hyperlipemic state. In blood plasma with total lipid levels under 1500 mg. per 100 ml., the bulk of the freely extractable lipid consists of cholesterol esters with a small amount of free cholesterol, glycerides, and free fatty acids and no phospholipids. Blood plasma with total lipids in excess of 200 mg. per 100 ml. shows a larger proportion of glycerides and some phospholipids in the freely extractable lipid. About 50 per cent of the unesterified fatty acids of the plasma appear in the freely extractable lipids before heparin is given and nearly all of the unesterified fatty acids appear in the freely extractable lipids after heparin. This suggests that much of the unesterified fatty acid is loosely bound to protein. Heparin also influences other lipid components of the freely extractable lipid.

Dietary Fat in Synthesis and Degradation of Cholesterol. In this study, the oxidation of the terminal carbon atoms of cholesterol by the liver mitochondria of rats fed diets rich in corn oil or a commercial shortening was observed. The mitochondria of the rats fed shortening oxidized cholesterol at a faster rate than did mitochondria from rats fed corn oil. Further experiments in this area are being undertaken.

Unsaturated Fatty Acids and Plasma Lipids. In this study, dietary as well as physiologic factors influenced the serum cholesterol level. Although the essential unsaturated fatty acids may be involved in cholesterol transport, it does not necessarily follow that an excess of dietary linoleic acid is desirable. The proportion of dietary carbohydrate, fat, and protein over a protracted period may influence the degree of formation of plaques and atherosclerosis more dominantly than soft or unsaturated fats. It seems that the arterial wall *per se* should receive as much study as the serum cholesterol value.

Arteriosclerosis — The Lesion. A concept of pathogenesis of atherosclerosis is presented in which atherogenesis has been sharply delineated from the subsequent evolution of lesions to the stage of clinical disease. The data indicated active metabolic processes under the control of local and systemic factors as a probable mechanism involved in atherogenesis. The current concepts of passive filtration as the major mechanism were not supported. Occurrence of early lesions in all subjects beyond the age of three years and the persistence of these lesions in a potentially reversible form for a period of many years has indicated that the problem is basically a pediatric one.

Dietary Fat and Plasma Cholesterol. In this speculative review, three points are discussed: (a) the relationships which have been observed between the polyunsaturated fatty acids and plasma cholesterol; (b) the possible functions of plasma cholesterol esters; and (c) the mechanisms whereby polyunsaturated fatty acids might bring about changes in the levels of circulating cholesterol.

THE AMERICAN JOURNAL OF NURSING

Vol. 60, January, 1960

*How does a nurse teach nutrition to patients? E. Morris.—p. 67.

Teaching Nutrition. "All too often nurses stop teaching and start preaching when they discuss nutrition with patients," is the interesting comment introducing the author's discussion. If teaching is to be taken to heart, at least three principles are involved. First, both the patient and the nurse must know what the problems are before planning improved nutrition. Often the patient does not completely understand his own situation, and rapport must be established. The value of diet summaries is emphasized. The second teaching principle is that of helping the patient to become emotionally involved in his nutrition problem (the problem must be a problem to him). Third, the nurse must believe what she teaches, or she will communicate her lack of conviction.

AMERICAN JOURNAL OF PUBLIC HEALTH

Vol. 50, January, 1960

*Toxic shellfish in British Columbia. L. S. Anderson.—p. 71.

Toxic Shellfish in British Columbia. An outbreak of poisoning through shellfish around the Straits of Georgia, British Columbia and Washington in 1957 is reported. Symptoms were paraesthetic, and even though severe, they passed off within two or three days. This is the first recorded occasion where oysters have been involved. The relationship between the dinoflagellate phytoplankton which had become toxic and the shellfish which fed on it is discussed. Other factors, including rainfall, temperature, minerals, and salmon movement, were also interrelated in this outbreak. The possibility of using clam styles as plankton indicators is suggested.

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THE BRITISH JOURNAL OF NUTRITION

Vol. 13, No. 4, 1959

*Amino-acid content of raw and heat-sterilized cow's milk. S. Payne-Botha and E. J. Bigwood.—p. 385.

*The availability of bound nicotinic acid to the rat. 1. The effect of lime-water treatment of maize and subsequent baking into *tortilla*. E. Kodicek and P. W. Wilson.—p. 418.

Metabolic interrelationships of dietary riboflavin and vitamin B_{12} in the rat. W. V. Lavate and A. Sreenivasan.—p. 468.

The mode of action of dietary carbohydrate on protein metabolism. H. N. Munro, J. G. Black, and W. S. T. Thomson.—p. 475.

*The composition of tissue lost through reduction of diet in obese patients. H. Ljunggren, D. Ikkos, and R. Luft.—p. 485.

*Electrophoretic pattern of plasma proteins in clinically diagnosed cases of kwashiorkor (protein malnutrition) and undernutrition (marasmus) among Ceylonese children. N. G. Baptist, C. C. de Silva, and M. A. Sideek.—p. 488.

*Diet in pregnancy. 3. Diet in relation to the course and outcome of pregnancy. A. M. Thomson—p. 509.

Amino Acid Content of Cow's Milk. The effect of sterilization by heat on the amino acids in milk was studied. The milk was sterilized by autoclaving at 122° to 124°C. for 20 min. Under these conditions, the amino acids in raw milk were all recovered quantitatively from sterilized milk except for lysine, which suffered a 10 per cent loss. Cystine was possibly also affected.

Availability of Bound Niacin to the Rat. Maize and other cereals contain almost all their niacin in a bound form which is unlike any of the known nicotinoyl compounds in being unavailable to animals, and probably man. For the rat or pig, the full biologic activity of bound niacin in maize and other cereals can be released by hydrolysis with lime-water which liberates free nicotinic acid. In this study, the lime-water procedure was re-investigated in detail and various *tortilla* preparations were tested. For efficient liberation of niacin by treatment with lime-water, strict adherence to the original Mexican recipe was essential. In certain conditions, only partial hydrolysis of the bound form occurred during the cooking of maize kernels with lime-water, and the liberation was completed during the subsequent baking of the alkaline maize mash to *tortilla*.

Tissue Loss in Obesity. The composition of obesity tissue lost by people on a reducing regimen was estimated from the changes in total and extracellular body water and exchangeable potassium. Total water loss was 15 per cent and that of the extracellular water, 4 per cent. The potassium content was 23 m.-equivalents per kilogram.

Kwashiorkor and Undernutrition. Two groups of Ceylonese children, one suffering from kwashiorkor and the other from undernutrition (marasmus), were placed on high-protein diets, and their blood plasma was examined electrophoretically. On the high-protein diets, both groups showed a rapid increase of plasma albumin and total plasma proteins, but the increase in the albumin value in the undernutrition group was quantitatively less. No marked differences were found in the groups for alpha and gamma globulins in the plasma. The relative and absolute values for the alpha globulins were on the average higher in the kwashiorkor group than in the undernutrition group; on treatment, the values were reversed.

Diet in Pregnancy. The influence of diet on the course and outcome of pregnancy is reported. About five hundred primigravidae were studied, two hundred with normal clinical history and three hundred with a clinical abnormality of some kind. The mean nutritive values of the diets taken by these two groups did not differ significantly. More detailed analysis confirmed that there was little or no association between the nutritive value of the diet during pregnancy and duration of gestation, birth weight, antepartum hemorrhage, operative delivery, fetal malformation, perinatal death, or failure to breast feed. However, pre-eclampsia and a relatively high rate of gain of bodyweight were associated with a relatively high caloric intake and with a raised intake of most nutrients.

BRITISH MEDICAL JOURNAL

No. 5164, December 26, 1959

*Food and indigestion. An investigation of possible relationships. P. H. Friedlander.—p. 1454.

No. 5165, January 2, 1960

*Practical diets for lowering serum lipids. T. R. E. Pilkington, J. L. Stafford, V. S. Hankin, F. M. Simmonds, and H. B. Koerselman.—p. 23.

Food and Indigestion. A dietary survey of seventy patients with non-ulcer dyspepsia who attributed dyspeptic symptoms to certain specific foods was made. Thirty-six ate "indigestible" food mixed with barium sulphate. Radiographs were taken at intervals for 3 hr. The gall bladders of these patients were outlined with iopanoic acid. Simultaneous studies of gastric acidity were also made in twenty-one patients. The studies were subsequently repeated, a non-digestible food being used as a control. An attempt was made to correlate the patient's symptoms during the tests with the findings. Only four patients developed symptoms with the indigestible food; gastro-esophageal influx was present in two, but no mechanism was apparent in the other two. One other patient had symptoms with both the indigestible and control food, and three with the control food alone. It is concluded that in these patients the composition of the food did not play an important part in causing their dyspeptic symptoms.

Practical Diets for Lowering Serum Lipids. Serum cholesterol and low density lipoproteins have been effectively reduced by dietary means in out-patients with ischemic heart disease over a period of more than one year. The unsaturated fat diet was more efficient than the low-fat diet; it achieved without loss of weight lower levels of serum cholesterol, low-density lipoprotein, and S_f 0-12 and S_f 12-400 lipoproteins, the last significantly so. The unsaturated fat diet, being less monotonous, is better tolerated. The diet sheet as given the patients is illustrated. Basically, dairy produce and egg yolk were eliminated from a meat-free diet. Skim milk is allowed. Fish and vegetables were allowed without restriction, and the unsaturated fat was supplied in the form of soya oil (3 to 4 oz. daily). The soya oil had an iodine value between 130 and 135. After six months, the restrictions were relaxed and lean meat was allowed. Later, up to ¼ lb. weekly of a relatively unsaturated margarine was also permitted.

CIRCULATION

Vol. 21, January, 1960

*A study of the cardiac stigmata in prolonged human thiamine deficiency. D. T. Rowlands, Jr., and C. F. Vilter.—p. 4.

Cardiac Stigmata in Thiamine Deficiency. Eight patients with clinically recognizable chronic thiamine deficiency and beriberi heart disease were investigated from a pathologic point of view in an effort to establish the presence and the extent of characteristic morphologic stigmata. In these cases there were no pathognomonic cardiac alterations at necropsy. Individuals with cardiac failure of short duration and those with prolonged heart failure manifested identical pathologic lesions. It is concluded that beriberi heart disease is largely the result of a reversible biochemical abnormality and is not characterized by specific pathologic lesions.

DIABETES

Vol. 9, January-February, 1960

*Diabetic diarrhea with malabsorption syndrome. M. Ellenberg and J. J. Bookman.—p. 14.

Diabetic Diarrhea with Malabsorption Syndrome. The combination of diabetes and frank malabsorption constitutes a syndrome that has not heretofore been appreciated. In this paper, reports of two patients with diabetes who developed diarrhea with steatorrhea and malabsorption syndrome are presented. Both patients responded dramatically to corticosteroid administration. The pathogenesis of this syndrome is discussed. It is suggested that it may be conditioned by diabetes of prolonged duration in the absence of significant degenerative changes.

FOOD AND NUTRITION NOTES AND REVIEW (Australia)

Vol. 16, September-October, 1959

*Nutrient losses involved in cooking, processing and storage of food—a review. J. A. Moore.—p. 81.

Nutrient Losses in Foods. Considerable losses of weight, vitamins, and minerals occur in all foods between

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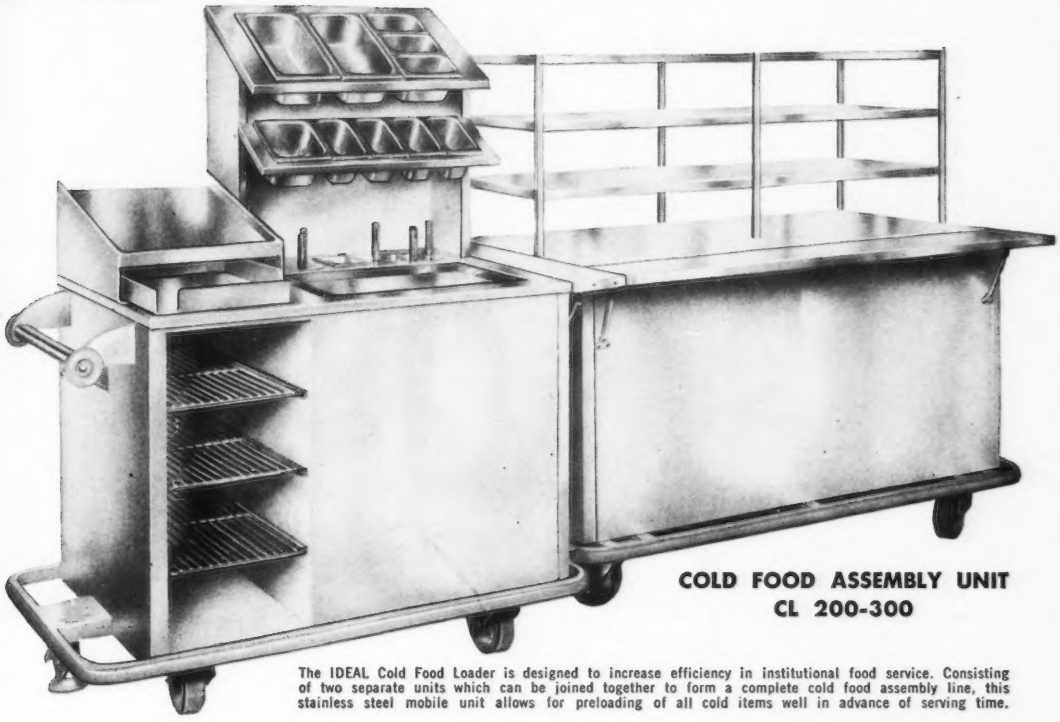

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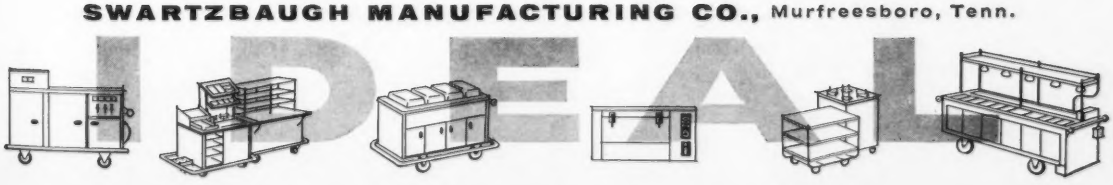

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the time of harvesting or killing and the final appearance of the food at a meal. The chief sources of these losses are storage, preparation, cooking, and processing. This paper is a review of the present knowledge of nutrient losses and includes the least wasteful methods of conducting the above operations.

FOOD RESEARCH

Vol. 24, November-December, 1959

*The influence of level of irradiation, temperature and length of storage upon the level of certain chemical components and panel scores for precooked beef, pork and veal. A. M. Pearson, L. J. Bratzler, O. F. Batzer, R. A. Sliwinski, and L. Chang.—p. 633.

*Effect of irradiation on quality of ground pork and of cooking conventionally and electronically. E. Lim, J. Yen, and F. Fenton. —p. 645.

*Effect of storage on the carbohydrate content of two varieties of potatoes grown in Canada and treated with gamma radiation. J. A. R. Cloutier, C. E. Cox, J. M. Manson, M. G. Clay, and L. E. Johnson.—p. 659.

*Studies on the retention of ascorbic acid during blanching of some Indian vegetables. M. C. Malakar and S. N. Banerjee.—p. 749.

*Effect of cooking rice with different volumes of water on the loss of nutrients and on digestibility of rice *in vitro*. M. C. Malakar and S. N. Banerjee.—p. 751.

Irradiated Precooked Meat. Taste panel ratings showed the unirradiated samples of beef, pork, and veal were preferred over the irradiated. Although there was a general improvement in scores during the shorter storage periods, differences between two levels of irradiation were not significant. There was no measurable effect of temperature or length of storage on scores. Most of the chemical components studied were increased on irradiation; some, such as methyl mercaptan and hydrogen sulphide, were not affected by level of irradiation, temperature, and length of storage. However, an increase in carbonyl compounds was correlated to the radiation level and to the lower temperature. Irradiation had no effect on total glutathione or reduced glutathione after cooking. Higher temperatures resulted in more breakdown in total glutathione and reduced glutathione than the low temperature. Although level of irradiation did not appear to influence pH values, after storage the mean for the samples irradiated at the lower level and stored at 2° C. was more acidic than for similarly treated samples irradiated at the higher level.

Irradiation and Ground Pork Quality. The effect of beta radiation on the quality of ground pork was studied and three methods of cooking were compared. Radiation significantly reduced: aroma, flavor, color, and juiciness scores; preference; cooking times; thickness after cooking; and moisture and thiamine content. Radiation also increased the diameter of patties during cooking; apparent fineness of grind; softness, moistness, waxiness, and looseness of texture, and apparent fat and peroxide content of both raw and cooked meat. Advantages and disadvantages of electronic cooking vs. conventional methods are considered.

Effect of Storage on Radiated Potatoes. The effect of gamma radiation on the carbohydrate content of two commercially important varieties of potatoes grown in Canada was undertaken. The significant difference was observed between the effect of the three doses of gamma radiation. The irradiated tubers showed an initial rise in reducing sugars and sucrose contents which was counter-balanced after four and a half months' storage at 40°F. Gamma irradiation made possible prolonged storage at room temperature; however, a large increase in sucrose content was observed in the treated tubers after nine months' storage at 68°F.

Ascorbic Acid Retention During Blanching. The effect of blanching on some common Indian vegetables in different media on the retention of ascorbic acid is reported. Blanching in an acid medium resulted in the greatest retention of ascorbic acid, but the culinary qualities deteriorated. To combine the retention of ascorbic acid with culinary quality, the method of blanching in sodium sulphite solution appears to be the best under conditions of this study.

Loss of Nutrients from Cooked Rice. Losses of thiamine, riboflavin, niacin, calcium, phosphorus, phytin phosphorus, iron, available iron, and nitrogen were observed during washing and cooking of rice with different volumes of water. The loss of nutrients during cooking of rice with just sufficient water was negligible compared with loss during washing. The losses of nutrients when cooked in six volumes of water was greater, and these losses increased when cooked with eight volumes of water. It was also observed that the rice cooked with more water was more digestible *in vitro* than the rice cooked with less water.

FOOD TECHNOLOGY

Vol. 13, December, 1959

*The influence of high temperature holding upon the components of coffee brew. 3. Hydrogen sulfide, sulfur dioxide, and sulfhydryl compounds (mercaptans). S. Segall and B. E. Proctor.—p. 679.

*Tenderness at various muscle depths associated with poultry processing techniques. R. G. Wise and W. J. Stadelman.—p. 689.

A method for screening flavor panel members and its application to a two sample difference test. B. A. Hall, M. Tarver, and J. G. McDonald.—p. 699.

*Qualities of beef as affected by cooking at very low temperatures for long periods of time. V. D. Bramblett, R. L. Hostetler, G. E. Vail, and H. N. Draudt.—p. 707.

*Glossary of some terms used in the sensory (panel) evaluation of foods and beverages. Taste Testing and Consumer Preference Committee.—p. 733.

Vol. 14, January, 1960

Radiation preservation of milk. 10. Studies on the radiation induced gelation of concentrated milk. Methods, and effect of some additives. J. E. Hoff, J. Sunyach, B. E. Proctor, and S. A. Goldblith.—p. 24.

Radiation preservation of milk. 11. Studies on the radiation-induced gelation of concentrated milk. The effect of polyphosphates. J. E. Hoff, J. Sunyach, B. E. Proctor, and S. A. Goldblith.—p. 27.

*Relationships between *p*H, tenderness, and moisture levels during early post-mortem aging of turkey meat. J. W. Dodge and W. J. Stadelman.—p. 43.

Coffee Flavor. The hydrogen sulphide content of one blend of brewed coffee was determined. No hydrogen sulphide was found. The quantities of sulphur dioxide were below the organoleptic threshold levels reported for this compound. The content of sulphur dioxide generally tended to decrease with increasing length and temperature holding. There seemed to be a relationship between the sulfhydryl (mercaptans) content of a coffee brew and the organoleptic rating of these brews. This suggests that the mercaptans content of coffee brew is closely associated with flavor and flavor changes.

Tenderness in Poultry Meat. This paper describes the tenderness pattern for poultry at different depths from the surface obtained by varying scald process techniques. Chickens were aged in an ice and water solution for 24 hr. They were then wrapped in aluminum foil and roasted in an oven at 325°F. for 2 hr. All cooked birds were cooled to 34°F. prior to removal of the breast muscle. Three slices were cut from the exterior surface using a commercial meat slicer. From these slices, samples were taken and subjected to a tenderness determination. Resistance to shear was related at a highly significant level to the depth at which samples were taken, to the temperature of scald water, and to the scald time. The toughening effect of high temperature-long time scald was related to the depth to which the scald heat penetrated the muscle tissue.

Low-Temperature, Long-Time Cooking of Beef. Although the method and length of cooking time influence tenderness and juiciness of meat, there is little definite information as to whether changes occur in the connective tissue only or in the muscle fibers also. This study was undertaken to determine the effect on less tender meat of long cooking at very low oven temperatures. The time-temperature combinations used had an effect on the tenderness of the meat, probably causing both physical and chemical changes in the connective tissue and in the muscle fibers themselves. The findings suggest the further study to find conditions that would produce the desired softening in the connective tissue with the least change in the muscle fibers.

Terms Used in Sensory Testing. The committee reporting undertook to develop a glossary of terms for use by taste panels. The final list, agreed on by the entire committee, consists of eighty-five terms. The committee was guided by the extent to which a term is used specifically in sensory testing. Only a minimum of terms

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which are basically psychologic or statistical in nature are included. This glossary is intended as: (a) a guide to students and investigators beginning work in this field and (b) an authoritative reference whereby different workers in the field may speak the same language.

Tenderness in Turkeys. A series of experiments was designed to investigate the tenderness problem in turkeys and to discover why cooler temperatures and aging in water produce more rapid tenderization. Water uptake and rates of cooling did not affect tenderness, whereas dehydration on hot carcasses produced a toughening effect which could not be aged out of the meat. Tenderization during early post-mortem periods was closely associated with *p*H. Total moisture content of the meat was associated with *p*H tissue and did not appear to be associated with water uptake, nor was it related to tenderness.

JOURNAL OF AGRICULTURAL AND FOOD CHEMISTRY

Vol. 7, December, 1959

*Storage of dieldrin in tissues and its excretion in milk of dairy cows fed dieldrin in their diets. N. Gannon, R. P. Link, and G. C. Decker.—p. 824.

*Storage of dieldrin in tissues of steers, hogs, lambs, and poultry fed dieldrin in their diets. N. Gannon, R. P. Link, and G. C. Decker.—p. 826.

*Insecticide residues in the milk of dairy cows fed insecticides in their daily ration. N. Gannon, R. P. Link, and G. C. Decker.—p. 829.

Vol. 8, January-February, 1960

*Flavor of cantaloups as affected by treatment with lindane. M. E. Kirkpatrick, J. L. Brogden, and R. H. Matthews.—p. 57.

Carbohydrates of the coffee bean. M. L. Wolfrom, R. A. Plunkett, and M. L. Laver.—p. 58.

*Constituents of meat flavor: Beef. I. Hornstein, P. F. Crowe, and W. L. Sulzbacher.—p. 65.

Post-mortem changes in the water-soluble proteins of bovine skeletal muscle during aging and freezing. M. J. Kronman and R. J. Winterbottom.—p. 67.

Storage of Dieldrin by Dairy Cows. Dieldrin, a chlorinated hydrocarbon insecticide, fed to dairy cows at levels of 0.1, 0.25, 0.75, and 2.25 p.p.m. appeared in the milk at the end of six to twelve weeks at average levels of 0.02, 0.06, 0.11, and 0.28 p.p.m., respectively. Tissue analyses at the end of the feeding period indicated that dieldrin was present in fats at concentrations varying from 0.24 p.p.m. at the lowest level of feeding to 5.48 at the highest. The amounts of dieldrin found in other tissues was proportionate to their fat content.

Storage of Dieldrin in Meats. Dieldrin was fed in the diet to various animals for twelve weeks at levels of 0.1, 0.25, 0.75, 2.25 p.p.m. Samples of tissues were then analyzed for dieldrin. It was detectable in the fat of all animals fed on the various intake levels. When detectable in other tissues, residues were proportional to the fat content of the tissues. For each species, the dieldrin stored appeared to be proportionate to the rate of intake. Laying hens stored the greatest quantity of all, but their eggs contained little dieldrin. Steers stored more dieldrin in their tissues in parts per million than did hogs, while lambs stored less than hogs.

Insecticide Residues in Milk. Aldrin, dieldrin, heptachlor, DDT, and methoxychlor were fed in the daily rations of dairy cows for sixteen weeks. For varying periods afterwards, the cows were fed on insecticide-free rations. Milk samples were analyzed through both periods to determine the rate of accumulation and decline. The rates of accumulation for the various insecticides were as follows: aldrin (excreted as dieldrin) > dieldrin > DDT > heptachlor (excreted as heptachlor epoxide) > methoxychlor.

Insecticides and Cantaloup Flavor. The flavor of cantaloups treated with lindane as a dust, wettable powder, or emulsion concentrate was compared with the flavor of untreated melons. These palatability evaluations indicated that lindane applied as a dust had no detrimental effect on flavor. The effect of lindane wettable powder on flavor of melons was less definite, but its use may contribute to off-flavor. Treatment with lindane emulsion concentrate adversely affected the flavor of cantaloups.

Constituents of Beef Flavor. The flavor precursors of cooked beef are water-soluble. Lyophilization of a water extract yields a powder concentrate that on heating develops a flavor similar to that of cooked beef. A standard technique for the heat treatment and fractionation of the flavor constituents in this powder is described. Small amounts of carbonyls, ammonia, and hydrogen sulphide were found in the most volatile fraction. An oily, viscous, liquid mixture of very low vapor pressure, but with a strong aroma, was also isolated.

Meat Aging and Freezing. Alteration of the water-soluble proteins of bovine skeletal muscle is of particular interest, because these proteins have enzymatic character and are involved in biochemical processes occurring in meat. The effect of aging meat for seven days and of freezing at −20°C. for five weeks was studied by various methods. Systematic differences in protein and enzyme aldolase contents were noted from muscle to muscle. Both aging and freezing of meat resulted in a decreased extractability of water-soluble proteins, as well as in a loss of specific electrophoretic and ultracentrifugal components.

JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

Vol. 172, January 23, 1960

*Misuse of milk powder. Foreign Letters–India.—p. 366.

*Radioactive contamination of food. Foreign Letters–United Kingdom.—p. 367.

Vol. 172, January 30, 1960

*Transfer of vitamins from mother to fetus. B. F. Chow and K. Okuda.—p. 422.

Misuse of Milk Powder. The Union Health Ministry of India requested organizations receiving milk for free distribution under the Indo-U.S. agreement to take all possible care in the distribution of milk powder so that it is not misused and sold in the market. Complaints have been made this happens from time to time. The milk received from UNICEF and the U. S. Technical Cooperative Mission comes in powdered form and is generally distributed in liquid form through various child welfare and primary health centers.

Radioactive Contamination of Food. The Radiobiological Laboratory of the British Agricultural Research Council has reported on its work on the contamination of food and agricultural land by radioactive substances. The concentration of strontium-90 in the body is determined by its ratio to calcium in the diet, as it follows the same metabolic pathways. Of the food consumed, milk accounts for 54 per cent of the strontium-90, flour for 12 per cent, cheese for 11 per cent, green vegetables for 10 per cent, meat for 4 per cent, drinking water for 4 per cent, fruit for 3 per cent, eggs for 0.6 per cent, and fish for 0.2 per cent. The maximum allowable concentration of strontium-90 in bone has been fixed at 100 micromicrocuries per gram calcium. Although this is unlikely to be reached, strontium-90 accumulates, and any rise in concentration in human bone must be seriously considered.

Transfer of Vitamins. The concentrations of various water-soluble vitamins and other nutrients were observed in fetal and maternal bloods to determine if transfer occurred. In twenty-five cases, the concentration of vitamin B_{12} in the fetal serum was higher than that in the maternal serum. This suggests an active transfer or drawing of vitamin B_{12} from the mother into the fetus. Other vitamins, such as ascorbic acid, thiamine, pyridoxine, and also iron, were drawn by the fetus from the maternal source. This did not apply to glucose or inulin. The data indicate that the differences in the vitamin B_{12} serum gradient will have physiologic meaning and specificity and that this phenomenon is not primarily a chemical one.

JOURNAL OF THE CANADIAN DIETETIC ASSOCIATION

Vol. 22, January, 1960

*An experimental approach to the problem of atherosclerosis. J. F. Mustard.—p. 10.

*Psychological aspects of obesity. J. M. Wardlaw.—p. 17.

*Diets in peptic ulcer. D. E. Rodger.—p. 20.

Experiments and Atherosclerosis. This investigator has proposed that dairy fats and eggs may, because of their content of coagulant-active phospholipid, accelerate blood clotting following ingestion. Theoretically, this could lead to platelet changes, larger platelet deposits on vessel walls, intimal thickening, and consequently ac-

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celerated atherogenesis. Some of the experimental evidence is briefly presented to show its relationship to the proposed hypothesis.

Psychologic Aspects of Obesity. A current review of the psychologic aspects of obesity is presented. References include work by Hamburger, Bruch, Suczek, Stunkard, and Young, among others.

Diets in Peptic Ulcer. A Canadian physician states that most doctors today are uncertain and unconvinced as to what diet, if any, to use for the patient with peptic ulcer and how strictly the patient should adhere to the diet. Experimental studies on the merits of various diets for ulcer are presented, including the work of Schneider on spices. The need for more basic research on the response of the gastric secretion in various foods is needed. Although there may be little scientific evidence in support of the bland diet, the author believes that a dietary prescription has a strong favorable psychologic influence on the patient. It is not so much what the patient eats that matters, but in what the patient believes he should eat. It is most important that he be convinced that what he is doing is the right thing for his ulcer.

THE JOURNAL OF CLINICAL INVESTIGATION

Vol. 38, December, 1959

*A study in man of cerebral blood flow and cerebral glucose, lactate and pyruvate metabolism before and after eating. G. G. Rowe, G. M. Maxwell, C. A. Castillo, D. J. Freeman, and C. W. Crumpton.—p. 2154.

*The relation of sulfur metabolism to acid-base balance and electrolyte excretion: The effects of DL-methionine in normal man. J. Lemann, Jr., and A. S. Relman. —p. 2215.

Cerebral Blood Flow. Eight human subjects have been studied by determination of cerebral blood flow and brain carbohydrate uptake before and after a test meal. During the time when the arterial level of glucose, lactate, and pyruvate was rising, the brain took up larger quantities of these carbohydrates. As the peak blood concentration of glucose was reached, the uptake returned to control values, and while the level of substances was falling rapidly, glucose uptake by the brain was reduced to below the control value. The fact that glucose and lactate uptake was not related to absolute arterial level is compatible with the thesis that the arterial level of these substances does not control their rate of utilization by the brain. Brain pyruvate extraction and calculated consumption were correlated directly with the arterial level of pyruvate.

Sulphur Metabolism and Acid-Base Balance. Balance studies were carried out on normal subjects given 13.9 gm. DL-methionine for periods of five to sixteen days. Administration of methionine produced small reductions in serum carbon dioxide associated with acidification of the urine and increased ammonium excretion. There was a prompt sulphate diuresis, the total cumulative increment representing approximately 70 per cent of the administered sulphur and 80 to 85 per cent of the methionine metabolized. During the loading period, potassium excretion increased slightly, but there was no definite change in sodium balance. With recovery, both sodium and potassium were retained. The changes in acid excretion were related to the observed reduction in serum carbon dioxide and to the calculated acid retention. After the final restoration of acid-base balance, accumulated increments in sulphate excretion were virtually equalled by the cumulative increments in excretion of net acid. This strongly suggests the production of 2 equivalents of hydrogen ion for each mole of oxidized sulphur and confirms the earlier view of the important contribution of sulphur metabolites to the endogenous fixed acid load.

THE JOURNAL OF NUTRITION

Vol. 70, January, 1960

*Maintained pregnancy in the rat as associated with progesterone administration and multiple-nutrient deficiency. K. A. Kendall and R. L. Hays.—p. 10.

*The utilization of some B vitamins administered to the rat apart from diet.—H. P. Sarett and A. B. Morrison.—p. 37.

*Evaluation of protein in foods. V. Factors influencing the protein efficiency ratio of foods. A. B. Morrison and J. A. Campbell.—p. 112.

Maintaining Pregnancy with Progesterone. This study has shown that fetal life can be maintained in the rat with the aid of ovarian hormones, even when the diet was deficient in more than one essential nutrient and even when the diet contained a single energy source, sucrose. It is suggested that progesterone is related either directly or indirectly to the mobilization of nutrients from maternal stores or to the maintenance of placental function.

Vitamin Administration Apart from Diet. Two experiments were conducted to determine whether limiting amounts of thiamine, riboflavin, pyridoxine, and pantothenic acid are used as well by growing rats when given apart from the diet as when given with the diet. It was shown that these B-vitamins given separately from the diet once each day were as well utilized as those incorporated in the diet.

Factors Influencing Protein Efficiency Ratio. In studies on factors influencing the protein efficiency ratio (PER) of foods, rats were fed various levels of protein supplied by casein or by a mixture of plant proteins. Female rats tended to give maximal PER values at lower dietary protein levels than did males. With both sexes, PER values dropped as the experiment progressed, but the decline was much greater with those fed casein than with those fed the plant protein mixture. It is concluded that the factors studied must be standardized if comparable results are to be obtained in different laboratories.

THE LANCET

No. 7113, December 26, 1959

*Resistance to ketosis in obese subjects. A. Kekwick, G. L. S. Pawan, and T. M. Chalmers.—p. 1157.

Resistance to Ketosis in Obese Subjects. It is much more difficult to induce ketosis in obese than in non-obese people. The difference does not appear to depend on a higher rate of utilization or excretion of ketone bodies by the obese. After intravenous injection of sodium-beta-hydroxybutyrate, the rate of disappearance of this ketone body from the blood was the same in obese as in non-obese people. Less than 1 per cent of the injected dose was excreted in the urine, and the amount excreted was the same in both groups. Presumably, the rate of production of ketone bodies is less in the obese. In non-obese people given a high-fat diet, the development of ketonemia and ketosis was preceded by a fall in the fasting blood sugar. In obese people on this diet, there was no such fall or it was small, and they did not develop ketosis to any significant degree. Reasons are given for believing that net conversion to fat and carbohydrate took place in both groups. It is suggested that obese people may be able to turn fat into carbohydrate at a higher rate than non-obese people.

NUTRITION

Vol. 13, Winter, 1959

*Catering and special diets in an acute geriatric hospital. M. E. Trussell.—p. 147.

Some aspects of dietetics and nutrition teaching in the United States of America. A. M. Copping.—p. 159.

Catering and Diets in Geriatrics. A dietitian in an acute geriatric hospital in Britain describes the duties of the two dietitians in her hospital: the caterer-dietitian and the therapeutic dietitian. Between them, they are responsible for all catering (including ordering but not purchasing), all therapeutic diets, out-patient and educational work, and the management of the main dining room. This arrangement seems ideal for the small to medium-sized hospital and means that the caterer-dietitian does not give up therapeutic work, a consideration which might induce more dietitians to take up catering.

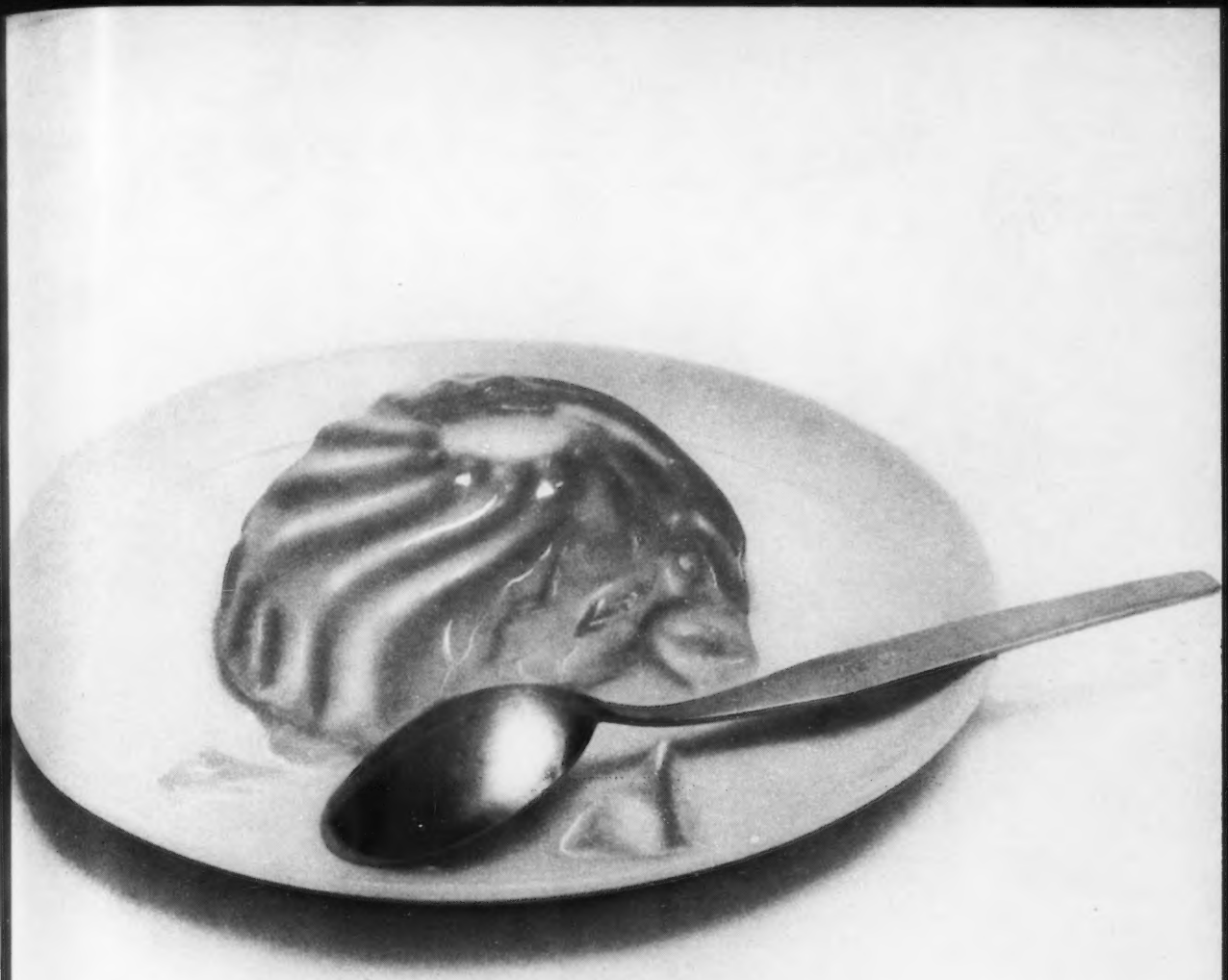
PUBLIC HEALTH REPORTS

Vol. 75, January, 1960

*Fallout and uptake of iodine-131. A. H. Wolff.—p. 63.

*Synthetic detergents in well water. J. Deluty. —p. 75.

Fallout and Iodine Uptake. Although this iodine-131 is a radionuclide with a half-life of about eight days, it is not insignificant. It concentrates in the thyroid gland and probably has resulted in a higher dosage level to any given volume of tissue than has any other fission-product nuclide. The



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CARBOHYDRATE	66.6 Gm.
VITAMINS:	
Vitamin A	555 units
Vitamin D	55 units
Vitamin E	2 units
Ascorbic acid	33 mg.
Thiamine hydrochloride	1.1 mg.
Riboflavin	1.1 mg.
Niacinamide	11 mg.
Calcium pantothenate	4.5 mg.
Pyridoxine hydrochloride	0.6 mg.
Folic acid	0.04 mg.
Choline bitartrate	55 mg.
Vitamin B_{12}	0.5 mcg.
MINERALS:	
Iron (from ferrous sulfate)	1.7 mg.
Calcium	700 mg.
Phosphorus	500 mg.
Sodium	210 mg.
Potassium	770 mg.

Sustagen is made from powdered whole milk, non-fat milk solids, calcium caseinate, maltose, dextrins and dextrose, plus vitamins and iron.

*Pareira, M. D.; Conrad, E. J.; Hicks, W., and Elman, R.: J.A.M.A. *156*:810-816 (Oct. 30) 1954.

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Public Health Service has included iodine-131, as well as certain other short-lived radionuclides, in its milk surveillance program. Iodine-131 levels in cattle thyroid may provide a presumptive index of the levels secreted into milk in the same region.

Detergents in Well Water. The presence of synthetic detergents or syndets in ground water is being reported with increasing frequency, and the number of incidents may be expected to rise still more as housing developments are constructed in areas not served by either public water supplies or public sewers. The presence of syndets in wells is believed to have resulted from their leaching through the ground into the ground water. Unlike soaps, which are precipitated by the calcium and magnesium in the water and left behind, syndets are only partly removed by a septic tank and absorption field. They are very stable chemicals and will travel appreciable distances through the ground into the water table and move with it. Presence of detergents in wells is evidence that seepage from the sewage disposal field is finding its way into the wells, and such wells should be considered polluted or potentially polluted.

THE TOHOKU JOURNAL OF EXPERIMENTAL MEDICINE

Vol. 70, September 25, 1959

*Diet and experimental diabetes. I. Influence of diet on carbohydrate metabolism in normal rats T. Saito, A. Wakui, and A. Ohneda.—p. 383.

*Diet and experimental diabetes. II. The dietary influence on the occurrence of alloxan diabetes in rats. T. Saito, A. Wakui, and A. Ohneda.—p. 395.

Dietary Effect on Carbohydrate Metabolism. Seven different diets were fed to rats to survey the dietary influence on the carbohydrate metabolism. A high-protein, high-fat, high-caloric diet decreased the carbohydrate tolerance for two months. Three factors, namely xanthurenic acid, overstrain of Langerhans' islets, and pituitary adrenal system, are discussed as presumably responsible for this mechanism.

Dietary Influence on Alloxan Diabetes. The dietary influence on the occurrence of diabetes mellitus induced by alloxan administration in rats was studied. Although in most rats diabetes was induced by 40 mg. per kilogram body weight of alloxan, occurrence of diabetes mellitus with 30 mg. per kilogram body weight of alloxan was the highest in the group on the high-protein, high-fat, high-caloric diet. It is suggested that the high-protein, high-fat, high-caloric diet intensifies the induction of diabetes mellitus with the administration of a small amount of alloxan and can spare the amount of alloxan to induce diabetes, because this diet has been shown to decrease the glucose tolerance in normal rats.

UNITED STATES ARMED FORCES MEDICAL JOURNAL

Vol. 11, January, 1960

*Nutrition in national defense and world peace. J. B. Youmans.—p. 69.

Nutrition in National Defense and World Peace. In this lecture, the program of nutrition surveys or assessments organized and conducted by the Interdepartmental Committee on Nutrition for National Defense (ICNND) in foreign countries participating in the Mutual Defense Assistance Program is described. In addition to the material benefits of improved nutrition, professional, technical, and public education, additions to scientific knowledge, and improvements in agriculture and food technology, these surveys have added immeasurably to the mutual understanding and friendship of peoples and governments.

AMERICAN RESTAURANT

Vol. 44, January, 1960

*The limited cafeteria. G. L. Wenzel.—p. 54.

The Limited Cafeteria. This is the second in a series of articles on the limited cafeteria. The idea seems to be popular because it eliminates a cook and two or three waitresses in a small restaurant. By definition, a limited cafeteria is an eating place with either a short cafeteria line or an order station equipped with a beverage station. The cafeteria line is best where there are steady customers who want a lunch plate or dinner plate; a repertoire of about thirty hot plates alternated on a thirty-day menu cycle is possible. Using the order station plan, a fixed and limited menu is preferred. The limited cafeteria idea depends on mass production of a few best-selling items which employ as much automation as possible. To illustrate, the author refers to several franchises which have proved successful with items such as hamburgers and fried chicken. Types of equipment are described and the advantage of cut and frozen food portions is stressed.

COLLEGE AND UNIVERSITY BUSINESS

Vol. 28, February, 1960

*Before plans are put on paper, use of scale models helps. C. R. Pensinger.—p. 46.

Planning with Scale Models. It is now possible to obtain quarter-inch scale models of institutional food service equipment. Many mistakes can be prevented if a food service director can spend some time living with his new food service facility; with a visual design which he and his staff have worked on over a period of months, he is better able to make suggestions and discuss revisions in plans. The use of these scale models at San Diego State College and at Jamestown (North Dakota) College is portrayed.

DRIVE-IN MANAGEMENT

Vol. 19, January, 1960

*Work schedules make management easier. D. E. Lundberg.—p. 22.

Work Schedules. Work schedules save time, since they orient and give direction to a food operation. There is an advantage in adding "how to do" directions to such a schedule; this combination work schedule-job instruction guide can then be discussed with new employees. An additional help is the production schedule which shows the work to be done by several employees. Invariably, the person working out the schedules achieves these results: combining tasks, rescheduling, more efficient use of employees, reduction of payroll, and better service. Sample schedule forms are included in the article.

FAST FOOD MAGAZINE

Vol. 59, January, 1960

*Rehydration—now it's in the bag!—p. 38.

Changes in Food Packaging. This article is an interview with D. N. Anderson, a pioneer research chemist in the development of film packs for convenience foods. He predicts that within five years, 50 per cent of the 120 million meals served daily in the nation's restaurants and cafeterias will be sealed in the boil-in-the-bag or heat-in-the-package type of container. The qualities of the polyester pouch are enumerated, and the advantages of this type of packaging are discussed. In the very near future, dehydrated foods may be reconstituted using this method. Work is being done, too, on storage and shipping problems, special dispensers, and new methods of pre-heating entrées of this nature. The boil-in-the-bag menu is limited only by the imagination of the food processor.

FOOD SERVICE MAGAZINE

Vol. 22, January, 1960

*Every day is Friday. R. Koenninger.—p. 28.

*More profits from roast meat. J. R. Norris.—p. 34.

*Profit pointer: "the electronic oven." E. Hawthorne.—p. 58.

New College Kitchen. Washington's Walla Walla College, with a new all-electric kitchen, has cut operational costs 20 per cent, although the new set up has six times more floor space than the old one. Claimed to be the nation's largest vegetarian food service, 1350 meals a day are served. In lieu of meat, menu staples emphasize dairy products, cereals, nuts, vegetables, and fruits. The entire food service building and its features are described.

Roast Meat. Roasting meats has many advantages for the food service operator. Newer developments are slow-roasting and over-night roasting (200°F. for beef and 225°F. for pork) which are possible in an electric oven. Meats done in this manner seem to be more tender, juicier, and of better quality. Foil wrapped meat or poultry offers advantages, too, although a higher temperature must be maintained to avoid steam-cooked meat. Tenderizers can eliminate tough roasts, and meats aged in plastic bags can reduce the costly problem of waste

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due to shrinkage during aging. Other innovations include special electronic controls for ovens and fans to circulate air in ovens, thus cooking faster and saving heating costs. Electromation in the future will bring further improvements in microwave and infrared ovens, adding again to the advancements made in meat roasting.

The Electronic Oven. The characteristics of the microwave oven are discussed. Such features as efficiency, cost control, fast service, cleanliness, styling, and savings are pointed out.

HOSPITAL MANAGEMENT

Vol. 89, February, 1960

*The art of seasoning low sodium diets.—p. 80.

Spices in Low-Sodium Diets. Though much has been written about making low-sodium diets palatable, there seems to be a lack of specific information on how to use spices in low-sodium foods. The following comments come from the institutional test kitchen of the American Spice Trade Association.

All spices, except for dehydrated celery and parsley flakes and certain seasoning blends, may be used in low-sodium diets. The exact sodium content of the major spices is given in a table. Seasoning blends must be considered separately and differ in content, depending on the manufacturer. Generally speaking, curry powder, apple pie spice, and pumpkin pie spice do not contain salt; chili powder, barbecue spice, shrimp spice, and seafood seasoning do.

Salt has a tendency to emphasize the flavors of spices and herbs; therefore, in low-sodium dishes, the spices need a slightly heavier hand. The patient should be conscious of a new and pleasant flavor that is strong enough to make him forget the lack of salt. Along with the many hints on how to use spices, it is suggested that all-purpose spice or herb blends be prepared and placed in shakers so that patients may season their own food. Proportions for three herb combinations are given. In addition, recipes for a few problem low-sodium foods are given, as are tips on buying spices.

HOSPITALS

Vol. 34, January 16, 1960

*Evaluation of dish machine compounds pays dividends. L. F. Edwards and I. Wingfield.—p. 79.

Evaluation of Dish Machine Compounds. As a phase of value analysis, the dietary department at Arizona State Hospital recently undertook an evaluation of dish machine compounds. Outlined here are the dish machine detergent specifications and dish machine service requirements which were established before the tests began. Preliminary tests were made on six dish compounds submitted for consideration. Eight tests were applied: (a) soil removability, (b) best rinsing, (c) least suds, (d) water softening, (e) solubility, (f) corrosive action, (g) emulsifying action, and (h) destaining. Detailed procedures are described for each test. Following the preliminary tests, two compounds were considered worthy of further testing. They were used in practical dishwashing tests in comparison with the compound currently being used at the hospital. Again, procedures are given. Only one compound of the three was found to be satisfactory for cleansing action of the number of dishes washed.

INSTITUTIONS

Vol. 46, February, 1960

*The marketing approach to profits. J. Thompson and L. H. Kotschevar.—p. 6.

*Recipe expansion made easy. J. F. Callahan.—p. 10.

*What managers, chefs, patrons expect. R. Flambert.—p. 20.

*Proper planning and design assure better food service out front. J. Laschober.—p. 112.

Food Service Industry Profits. The food service industry is in a paradoxical position—each year it is found on the lower rungs of the profits-per-dollar-income ladder; yet it can be one of the country's more highly profitable enterprises. One of the major factors has been that the industry has overstressed costs as the basis for establishing selling price. It has also failed to evaluate properly certain marketing principles. The authors continue by discussing three concepts relative to pricing and marketing theory: (a) the apparently different goals of production and marketing men (are costs all important?); (b) the concept of differentiated products (the industry needs to differentiate between the foods served away from home and those served by the homemaker); and (c) the relationship of cost to price (costs are not important to the consumer—he is concerned with what he is getting for his money).

Recipe Expansion. Changing recipe yields may be a difficult task for many cooks and bakers. Here is a guide to recipe expansion that can be applied to the recipes now on file in an institution. The system calls first for a change in recipe construction—listing the ingredients by percentage figures instead of by weight or volume. Also used is the "Recipe Magician," a slide-rule device which converts pounds and ounces of the original recipe to percentage figures and converts percentage figures back to pounds and ounces at any desired production level. The second tool is the "Yield Control Guide" which establishes the "expansion factor" of recipes. This factor helps determine at what point the "Recipe Magician" should be set to adjust the recipe. These tools are illustrated, using a salad recipe. Directions are given, too, for setting up expansion cards.

Credo for Management, Chefs, and Patrons. A step forward in food industry relations would result if suggestions such as those contained in this article were applied. Management expects the chef to prepare appetizing food, to follow policies of food and payroll control, to be a leader and

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an example; these are but a few of the qualities cited. Among other things, the chef expects from management are understanding, guidance, detailed information on costs, and good working conditions. The patron would like atmosphere, intelligent menus, no misrepresentation, attentive and unobtrusive service, sanitation—the list goes on and on. These and other factors are discussed.

Food Service Facilities. This is the first in a series of articles in which food service facilities *outside* the kitchen will be considered. Discussed here is the service or booster station, an essential installation to eliminate every possible waste step on the part of a waiter or waitress. Three types of stations are described: the counter type, the dining room service station, and the combination kitchen pick-up and service station. Suggested equipment is pictured and listed.

THE MODERN HOSPITAL

Vol. 94, January, 1960

*Search for better service led to major saving. F. O. Moosberg.—p. 96.

*Why purchase food on specification. G. W. Peffers.—p. 112.

Reorganizing a Decentralized Food Service. A six months' period of reorganization of food service has been undertaken at the University of Texas Medical Branch Hospital, Galveston. A central kitchen serving twenty-nine floor kitchens was involved. One month was used for a survey of existing conditions. Items checked were equipment, storage space, issuing of supplies, time element, and cooking methods. The many changes and improvements resulted not only in a saving of almost $100,000 per year, but also in better teaching and training methods, tighter control of food and supplies, and savings in labor. These improvements and changes are described.

Developing Food Specifications. Stressed here is the importance of kitchen testing in developing food specifications. The resulting information on yield is important not only for the cost data and suitable preparation methods, but also for determination of the most suitable grade, size or pack, variety, and trim of the product tested. Sample specification forms are included. It is pointed out that success of specifications depends on the guidance and follow-up exercised by management. Specifications should be subject to change as market conditions vary and new food products are introduced.

NRA NEWS

Vol. 3, January, 1960

*Close controls can prevent claims from foreign particles in foods served to public. R. Ellis.—p. 9.

*Testing toward the "perfect tray."—p. 14.

Foreign Particles in Food. Customer claims and newspaper references regarding foreign particles in food served in public eating places have been cause for alarm. Consequently, the National Safety Council issued a request to its members for information on the number of claims on foreign particles per meals served. Some of the data, presented in the article, indicate that this type of claim is not as prevalent as would be supposed. However, it should be noted that glass was the most frequently reported offender, with metal running a close second. Most restaurants have been able to decrease the number of foreign-particle claims by a careful review of the storage and handling of glassware. Training in materials handling and close supervision have also reduced claim rates. Illustrated is the fact that a review of foreign-particle claims will reveal the major source of contamination, pinpoint ways to eliminate the unsafe practices resulting from this source, and be instrumental in preventing costly public liability claims.

Plastic Cafeteria Trays. For the past two years, the staff of the Food Service Industry Research Center at Michigan State University, East Lansing, has been testing plastic cafeteria trays. Objectives were to set up recommendations for handling by which users could obtain a longer service life from trays and to assist manufacturers of plastic cafeteria trays in improving the properties of their products. Testing techniques are explained. As manufacturers improve their products, further tests will be made. Based on the work done to date, the following recommendations are made to extend the service life of trays now being used: (a) avoid use of excessively high wash and rinse water temperatures; (b) avoid abrasive materials or tools for scraping and scouring; (c) rinse trays as soon as possible after use, to reduce food stains; (d) use detergents as recommended by manufacturer, since excessive strengths of detergents cause discoloration, and (e) stack trays to reduce warpage and cracking.

PROFESSIONAL NURSING HOME

Vol. 2, January, 1960

*Getting upwards with a nutrition ladder. N. D. Robertson.—p. 6.

*Swope Ridge—new residence for elderly. N. Carnes.—p. 14.

Food for the Older Patient. Using the symbolism of a ladder, the author illustrates how protein, energy foods, calcium and phosphorus, iron, and the vitamins are steps upward to better nutrition. Attention is given to various problems encountered in feeding older people (indigestion, flatulence, constipation, the *actual* consumption of food, and meal hours). There are hints, too, for improving the actual food preparation.

Home for Elderly Citizens. Swope Ridge is the new home in Kansas City for sixty-six elderly citizens. Of special interest are the items relating to food service. For bed patients, meals are delivered via a mobile food service conveyor. A small 10 by 14½ in. tray

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1. Macy, I. G.; Kelly, H. J., and Sloan, R. E.: With the Consultation of the Committee on Maternal and Child Feeding of the Food and Nutrition Board, National Research Council: The Composition of Milks, National Academy of Sciences, National Research Council, Publication 254, Revised 1953. 2. Brown, G. W.; Tuholski, J. M.; Sauer, L. W.; Minsk, L. D., and Rosenstern, I.: Evaluation of Prepared Milks in Infant Nutrition, Use of the Latin Square Technique. To be published.

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enables the carrier to hold forty rather than the usual twenty hospital trays. Deep compartment dishes help the patient keep food more easily within the dish. All dishes for the bed-fast are plastic. China dishes are used in the dining room. Wine is served with the evening meal. Instant coffee and potatoes are ordinarily used. A stove and refrigerator are available for the ladies to try out old and new recipes. Tea time, a great source of enjoyment, has been expanded to three between-meal servings, with fruit juices, eggnog, and milk the usual beverages. The dietary staff is under supervision of a dietitian.

SCHOOL LUNCH JOURNAL

Vol. 14, February, 1960

*When the earth quakes. V. Valena.—p. 20.
*Disaster food service.—p. 25.

Emergency Feeding after an Earthquake. The author, a Red Cross worker as well as a school lunch supervisor, reports on her experiences in setting up emergency feeding for 500 persons at Tehachapi, following the disastrous earthquake of 1956 in Bakersfield, California. Equipment and food were "scrounged" from damaged stores, and volunteer help "manned a production line." Organization, the author believes, is the key to setting up such operations. With proper planning and delegation of duties, confusion and inefficiency can be minimized.

Disaster Food Service. Disasters, whether natural or man-made, call for emergency feeding. Because in most communities, schools are the easiest areas to use, the school lunch worker should be responsible for working with the local school administration, Red Cross personnel, and Civil Defense units to make a disaster plan *before* any emergency. Steps to take in planning are outlined; recommended foods are listed; methods of water purification are given; sanitation is discussed; sources of information are given. Also included is the organization plan for the integration of school food service, shelter, and transportation forces into a community disaster service, as prepared by the American Red Cross and the American School Food Service Association.

VOLUME FEEDING MANAGEMENT

Vol. 14, January, 1960

*How to write food "specs."—p. 32.
*The mechanics of dishwashing.—p. 174.
*Dinnerware buying guide.—p. 198.

Food Buyer Needs Written Specifications. In order to write food specifications, a buyer must know exactly what he wants and then be able to define his requirements clearly in words mutually understood by purveyors and buyers throughout the trade. The effective use of specifications entails: (a) knowing what is on the market in terms of quality, size, count, weight, style of cut, and so on; (b) relating this information to the needs of your operation; (c) describing precisely the units of food that will most advantageously serve your purpose; and (d) checking all food as it is received to make sure that it meets the standards set up in the specifications. Hints are given to help set up specifications. Also included are points to note in buying meat, canned goods, frozen foods, and fresh produce.

Mechanics of Dishwashing. Dishwashing performance depends on all equipment, including that used to get dishware to the machine and back into service. Three pages of illustrations show some ways to make better use of equipment. There are also buyer's checklists for dishwashing machines, pot washers, waste disposers, and silverware washers and burnishers.

Buying Guide for Dinnerware. Two questions are answered in this article: (a) What quantity per set of each piece of dinnerware is needed for efficient day-to-day operation? (b) What are reasonable replacement quantities of each piece? The chart giving this information was prepared by a New York City hotel on the basis of experience with six types and sizes of feeding operations—a specialty restaurant, a nightclub, a cocktail lounge, a coffee shop, hotel room service, and banquet facilities.

WHAT'S NEW IN HOME ECONOMICS

Vol. 24, February, 1960

*Time-saving, money-saving, meat cooking lessons. F. L. Beinert.—p. 64.
*Home economics in an elementary school: a case history.—p. 66.

Teaching Meat Cookery. Many home economics teachers have requested help in solving the problem of teaching the principles of meat cookery in the face of limitations of classroom time and funds for teaching materials. A practical solution lies in the versatility of ground meat (beef, lamb, veal, and pork) which is economical and quickly and easily prepared. This article presents detailed steps for using the various dry-heat and moist-heat techniques in meat cookery, as applied to ground meat.

Third Grade Food Activities. For several years, food activities have enriched the third grade curriculum at the Metcalf School, Illinois State Normal University. Recently, the home economics teacher has been made available as a resource person for all teachers, and there is access to a laboratory. Thus new ways can be explored to make the three R's a living part of the child's world. The most recent food activity in the third grade was a "packet meal," a planned picnic, which was developed through the classes in arithmetic, social studies, and language arts. A meeting of the mothers also served to set the stage. The day-to-day plans for preparing the lunch are outlined. It is pointed out that the success of such a project depends on the enthusiastic working relationships of the pupil, the teaching staff, and the parents.

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Adults.....2 or more cups
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GROUP 3

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Include a citrus fruit or tomato, a dark-green or yellow vegetable, and other vegetables and fruits, including potatoes

GROUP 4

MEAT GROUP

2 or more servings daily

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The nutritional statements made on this chart have been reviewed by the Council on Foods and Nutrition of the American Medical Association and found consistent with current authoritative medical opinion.

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BIOGRAPHICAL NOTES FROM THE HISTORY OF NUTRITION

Francois Magendie — October 6, 1783 – October 7, 1855

François Magendie was the teacher of Claude Bernard, the great French physiologist, and sometimes his own work is forgotten in the acclaim of his great student and laboratory assistant. However, Magendie was the pioneer of experimental physiology and founder of modern experimental pharamacology. He also carried on some nutritional experiments that demonstrated nitrogen as an essential in the diet of animals.

François Magendie was born in Bordeaux, France, October 6, 1783, the son of Antoine and Marie N. Deperey Delaunay Magendie. His father was a surgeon and undoubtedly influenced his son's choice of medicine as a career. His father also was a follower of the teachings of Rousseau; thus François had no formal education until he demanded it at the age of ten. He learned quickly, and at sixteen began his medical studies in Paris, finally receiving his diploma as a doctor of medicine in 1808. The previous year he was appointed an aide in anatomy in the Faculty of Medicine.

Magendie had exceptional ability in teaching others what he himself was learning and could always support himself by private teaching and his assistantship in anatomy. Medicine and experimental physiology soon replaced surgery and anatomy as his fields of interest. He developed a good private practice and was on the staff of Hôtel-Dieu from 1830 until his retirement in 1845; he was first a lecturer and later professor of medicine (1831) at the Collége de France.

Magendie was a leader of his time in believing in the importance of experimental physiology; he believed that all processes could be explained on the basis of chemistry and physics. He had great energy and curiosity but sometimes did not continue his experiments long enough and thus drew wrong conclusions from them. In 1821, he started the first journal of experimental physiology; he was the sole editor and owner, and the journal continued for ten years. Extensive experimental studies were carried on in toxicology and pharmacology, and on the nervous system; from these latter researches came the famous Bell-Magendie controversy on priority of discovery.

Of particular interest to the nutritionist is Magendie's experimental work, described in his book *Précis eléméntaire de Physiologie* (1816), on the need for nitrogen-containing food in the diet of animals. Dogs fed single foods, such as sugar and distilled water, or olive oil and water, or butter and olive oil, all died in an emaciated condition. Magendie concluded that animals could not live without nitrogen in the diet. He argued that body tissues contain nitrogen, that nitrogen is present in many foods, and it is probable that tissue nitrogen comes from food. Other experiments showed that rats and guinea pigs fed a single substance, such as wheat, barley, oats, cabbage, or carrots, died in about two weeks but animals fed a combination of these foods thrived. From the dietetic point of view, Magendie used diet and plenty of fresh water as his chief remedies along with simple medications. He found that sugar in the blood was a normal occurrence and thought that this was important in the study of diabetes mellitus.

He was a very honest, hard working scientist. He seems to have been a combination of two personalities—affable and kindly to his acquaintances, but in the laboratory, brusque and harsh and among his colleagues, frank and often rude in his criticisms. With advancing years, he became more conservative.

Recognition of Magendie's leadership in physiology came from many sources and included election to the Academy of Science (1821), of which he became president (1831), and the cross of the Legion of Honor (1829).

In 1830, Magendie married Henriette Bastienne de Puisaye, a young and well-to-do widow, and had a country home at Sannois. It was here that Magendie died of a coronary sclerosis on October 7, 1855, at the age of seventy-two.

REFERENCES: Olmsted, J. M. D.: François Magendie, Pioneer in Experimental Physiology and Scientific Medicine in XIX Century France. N. Y.: Henry Schuman, Inc., 1944; Fenton, P. F.: François Magendie. J. Nutrition 43: 3, 1951; Bing, F. C.: A forgotten contribution to nutrition by Magendie. Science 74: 456, 1931.—*Contributed by E. Neige Todhunter, Ph.D., Dean, School of Home Economics, University of Alabama, Tuscaloosa.*

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Army Honors Miss Gleiser. On February 2, Fern W. Gleiser, former President of A.D.A., received from the Army a Certificate of Appreciation for her work as a member of the Army's Defense Advisory Committee on Women in the Services from 1957 through 1959. The award, which was presented at an impressive ceremony at the Headquarters Fifth Army, Chicago, was made for Miss Gleiser's assistance in interpreting to the public the need for and the role of women in the Armed Services and in emphasizing the responsibility assumed by all components of the Department of Defense for the effectiveness and the well-being of service-women. Following the presentation, Miss Gleiser was the honored guest at a luncheon and cake-cutting ceremony at the Headquarters marking the fifty-ninth anniversary of the founding of the Army Nurse Corps.

More recently, Miss Gleiser has accepted an appointment as consultant to the Surgeon General of the Army.

Harvard Receives Million-Dollar Grant for Nutrition Research. General Foods Corporation will give to Harvard School of Public Health for nutrition research a total of a million dollars to be paid over a ten-year period, $100,000 each year. The funds will be used for expansion of the nutrition research facilities. A new four-story nutrition laboratory is planned as part of a projected fifteen-story research structure to be built in Boston, with the aid of other funds from the National Institutes of Health. In making the announcement, Dr. Nathan M. Pusey, President of Harvard, noted that this is the largest gift ever made by any business corporation for Harvard's capital purposes.

Frozen Foods for April. The National Association of Frozen Food Packers suggests the following foods as suitable for features of menus in April.

Frozen Fruits and Juices

CONCENTRATES OF CITRUS JUICES AND OTHER JUICE COMBINATIONS—may be used not only at breakfast, but as appetizers on dinner menus

BLUEBERRIES—a sprinkle with other fruit on a salad adds both visual and taste contrast

PEACHES—appealing as a garnish on the plate featuring ham. For dessert, frozen peaches are a treat.

RASPBERRIES—use as eye-catchers during the cereal-and-milk spring festival

Frozen Vegetables

BEANS, GREEN—pretty and delicious when combined with frozen cut corn for succotash

PEAS, GREEN—make root vegetables more interesting by combining peas with turnips, carrots, onions, or potatoes

SPINACH—becomes a delicious main dish when prepared with a poached egg and topped with a sprinkling of cheese or cheese sauce

Prepared Seafood Entrées

Many new ones are now available, which may be used to provide menu variety.

Gordon Research Conference. The 1960 Gordon Research Conference on Food and Nutrition will be held the week of August 8 at Colby Junior College, New London, New Hampshire. Meetings will be held morning and evening, Monday through Thursday, and Friday morning. The program lists the following papers:

"The Use of a Chelating Agent in Food Processing"—F. J. Butt

"Characterization of Flavors by Gas Chromatography"—D. A. M. MacKay

"Radioactive Tracers for Screening New Food Additives for Safety"—R. Thiessen, Jr.

"The New Regulatory Control of Food Additives"—B. L. Oser

"Correlation of Biochemical Measurements with Other Parameters of Nutritional Status"—W. N. Pearson

"Correlation of Clinical Observations with Nutritional Status"—I. C. Plough

"Interpretive Guides for Nutritional Appraisal"—D. Mark Hegsted

"Dietary Survey Techniques and Interpretation"—Dorothy F. Hollingsworth

"Amino Acid Imbalance"—A. E. Harper

"Amino Acids in Blood Plasma as an Indication of Biological Value of Proteins"—J. B. Longenecker

"Use of Water-Soluble, Chemically Defined Diets in Studies of Nonessential Amino Acids and *in vivo* Metabolic Processes"—Milton Winitz

"Food Technology and the Availability of Dietary Amino Acids"—K. J. Carpenter

"Evidence for the Prevention of Atherosclerosis in Man by Dietary Means"—Robert E. Olson

"Lack of Evidence for the Prevention of Atherosclerosis in Man by Dietary Means"—George V. Mann

"Experimental Production of Severe Protein Malnutrition"—B. S. Platt

"Effect of Processing on the Properties of Dietary Fats"—O. S. Privett

"Nutritional and Metabolic Effects of Radiation"—J. G. Coniglio

Attendance will be by application and will be limited to approximately one hundred conferees. Standard application forms, which must be used by applicants, may be obtained from the Director of the Conference, W. George Parks, Department of Chemistry, University of Rhode Island, Kingston. Selection of applicants will be by committee action.

Future Events. New York City's eleventh *Nutrition Week*, May 1 to 7. Theme: "It's the Food You Eat That Counts."

Symposium on Nutrition in Tooth Formation and Dental Caries sponsored by the Council on Foods and Nutrition, American Medical Association, Harvard School of Dental Medicine, Massachusetts Medical and Dental Societies—Boston, May 19.

Institute for Dietary Department Administration, co-sponsored by the American Hospital Association and A.D.A.—Washington, D. C., May 23 to 27.

Silver convention of the *Canadian Dietetic Association*—Montreal, June 14 to 16, 1960.

Institute for Dietary Department Administration, co-sponsored by the American Hospital Association and A.D.A.—San Francisco, June 20 to 24.

American Home Economics Association Convention—Denver, June 28 to July 1.

New York State Nutritional Institute, co-sponsored by Graduate School of Nutrition, Cornell University, and the New York State Nutritional Council—Ithaca, July 7 and 8.

More Summer Study Opportunities. For the second year, the *Group Dynamics Center, Teachers College, Temple University*, Philadelphia, will conduct a five-day "Laboratory on the Administrative Role in Community Organizations," June 13 to 18. The program will be designed to help administrators in public or private community organizations to gain a deeper understanding and insight into the human relations of organizational life as it affects the administrative role. Emphasis will be put on the following areas: understanding and using organizational structure, interpersonal relationships within an organization, examining one's own role within an organization, motivating people to accept job responsibility, and handling authority in administration. Registration will be limited to people who have had at least two years in an administrative position and are now responsible for the supervision of other staff members. Two semester hours of graduate credit may be earned by qualified participants.

A special course in "Community Health and Nutrition" will be given July 11 to 27 at *Mississippi Southern College*, Hattiesburg. The course will be taught by Anna dePlanter Bowes, former nutritionist, Pennsylvania Department of Health, Harrisburg.

Washington State University, Pullman, this summer will offer from June 13 to 24 a special ten-day graduate study program on food service administration, under the direction of

Chiquita Banana suggests:

Good health idea: Bananas!

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Fern W. Gleiser, Professor of Institution Economics and Management, Graduate School of Business, University of Chicago. The course will cover the latest developments in administration, management techniques and procedures, and personnel relations. It has been planned to benefit graduate students and serve, as well, as a refresher course for food service administrators in hospitals, restaurants, hotels, school lunch programs, and college and university food services. Two hours' credit will be earned by students participating in the course.

National Health Forum. "Positive Health of Older People" was the theme of the 1960 National Health Forum, held in Miami Beach, March 14 to 17. Discussions at the Forum, which is sponsored by the National Health Council, pertained to ways "to remove present obstacles to more positive health of older people, to stimulate effective action programs, to promote further research, and in general to promote changes in attitude toward the aging from a sickness orientation to a health orientation," according to Dr. Edward L. Bortz, Chairman of the Forum. Dr. Bortz, who is Chief of Medical Service, Lankenau Hospital, Philadelphia is President-Elect of the American Geriatrics Society.

Included on the program was a description of Sweden's experiences in a comprehensive health program for older people, presented by Dr. Ali Berggren, Governmental Supervisor of the Royal Board of Social Welfare, Stockholm. Dr. Leroy E. Burney, Surgeon General, U.S. Public Health Service, spoke on the significance of the Forum in relationship to the 1961 White House Conference on Aging. G. Warfield Hobbs, Chairman of the National Committee on the Aging, National Social Welfare Assembly, developed the topic, "Older People Are Needed—A Challenge to America."

A.D.A., which is a member of the National Health Council, was represented at this meeting by Nelda Ross Larsson, who also serves as the Association's representative at other meetings and conferences pertaining to problems of the aged.

Symposium on American Diet. A one-day symposium on "The Revolution in American Diet" was held in New York City on February 16, under the sponsorship of The Melamine Council. The program featured a number of well known speakers:

"Cultural Patterns and the American Diets"—Dr. Margaret Mead, Anthropologist, American Museum of Natural History, New York City

"The Under-Fed"—Dr. James M. Hundley, U.S. Public Health Service, Washington, D. C.

"The Well-Fed—Changing Patterns of Food Consumption"—Hazel K. Stiebeling, Ph.D., Director, USDA's Institute of Home Economics, Washington, D. C.

"The Over-Fed"—Dr. Theodore B. Van Itallie, Director of Medicine, St. Luke's Hospital, New York City

"Protection of Our Food Supply"—Dr. Paul L. Day, Scientific Director, U.S. Food and Drug Administration, and Lawrence A. Coleman, Food Additives Committee, Manufacturing Chemists Association

"Educating Children in Proper Diet"—Dr. Willard J. Jacobsen, Director, Nutrition Education Research Project, Columbia University, New York City

"Educating Adolescents and Adults in Proper Diet"—Dr. Charlotte M. Young, Professor of Nutrition, Cornell University, Ithaca, New York

"Meeting Tomorrow's Food Needs"—Charles G. Mortimer, Chairman, General Foods Corporation, White Plains, New York

Nutrition Conference in Detroit. On March 18, *Wayne State University College of Medicine* sponsored its sixth annual nutrition conference. The general subject of "Prospects in Nutrition," was developed by such speakers as Dr. Paul L. Day, Scientific Director, U.S. Food and Drug Administration; Dr. Howard A. Schneider, Rockefeller Institute; Dr. Philip L. White, American Medical Association; and Dr. James L. Wilson, University of Michigan.

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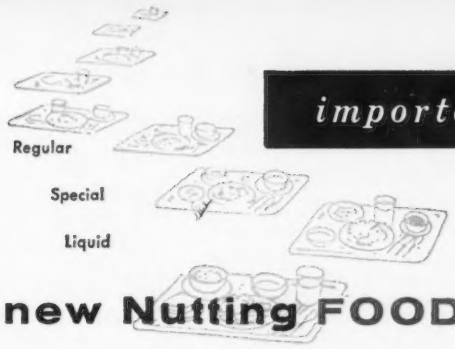
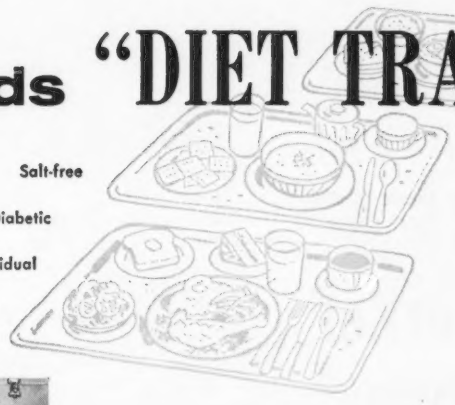


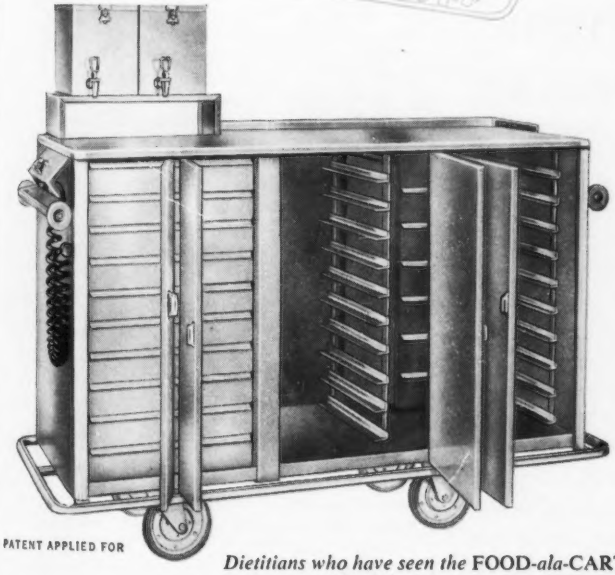
The all new Nutting FOOD-*ala*-CART System

ends "DIET TRAY CONFUSION!"



Here for the first time is a food service system that ends one of the biggest problems facing dietitians . . . "Diet Tray Confusion." FOOD-*ala*-CART is the first and only food service system to provide *one oven drawer* for *every serving tray!*

This exclusive FOOD-*ala*-CART feature ends "Diet Tray Confusion" and makes spot checking easier—more accurate. It also speeds tray assembly — makes it simpler.



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Dietitians who have seen the FOOD-*ala*-CART system say it's the easiest to use equipment they have ever seen. Its design is based on a comprehensive research study among dietitians. These dietitians told us it's not the fixing of the food but the serving that is the big problem. The Nutting FOOD-*ala*-CART answers the serving problem best because it simplifies it, ends "diet tray confusion," keeps foods appetizing, refreshing, delicious tasting right to the patient. It is truly *the new standard of fine food service for hospitals.*

Only the new FOOD-*ala*-CART system offers *all* these features!

- ONE OVEN DRAWER FOR EVERY SERVING TRAY ends "diet tray confusion." It's the easiest to use food service system you have ever seen.
- FROZEN FOOD SECTION keeps frozen desserts served in sliced form, in ramekins or similar containers *frozen;* even ice cubes won't melt.
- ALL FOODS are served at dietetically accepted temperatures for maximum patient "meal appeal."
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- ROLLS EASILY — Large ball-bearing wheels with non-marking rubber tires especially compounded for easier starting, easier rolling.
- COMPACT SIZE makes FOOD-ala-CART easier to handle. Clears any hall, door or elevator opening.
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Everyone is happier with FOOD-*ala*-CART! Patients, physicians, nurses, aids *and* dietitians, *all* like the way FOOD-*ala*-CART eases preparation, keeps foods appetizing and simplifies serving.

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Officers of Nutrition Directors Association. Newly elected officers for 1960 to 1962 for the Association of State and Territorial Nutrition Directors are: President, Frances Shoun, Director of Nutrition, Tennessee Department of Public Health, Nashville; President-Elect, Ann Mathews, Chief Nutritionist, Bureau of Preventive Medicine, Maryland Department of Health, Baltimore; and Secretary-Treasurer, Margaret A. Dunham, Director, Division of Nutrition, Indiana State Board of Health, Indianapolis.

The objectives of this Association are:

(a) To study ways and means of developing the nutritional aspects of health department programs.

(b) To strengthen nutrition practices in health department programs through the exchange of methods and techniques.

(c) To develop opportunities for greater coordination of nutrition services among professional persons in the fields of health, education, and welfare.

(d) To strengthen educational preparation at graduate and undergraduate levels of those who enter the field of public health nutrition.

(e) To acquaint educational institutions with the kind of information that will be helpful in orienting both faculty and students to the field of public health.

(f) To develop means of orienting dietetic interns to the field of public health.

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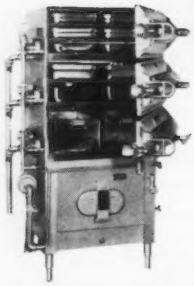

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They cook faster and better too. Steam-cooked foods are better because natural juices, vitamins and other food values are retained . . . not "cooked away." They look and taste better . . . to lure appetites.

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Booklet to Fight Faddists. "Food Fact or Fad?" is the title of a new booklet from the South Dakota State College Agricultural Extension Service. In readable terms for the lay person, such topics are covered as: how to recognize a "food quack," favorite themes of faddists, why faddists are believed, and types of food fads, including fears of specific foods; reducing diets, pills, and devices; and so on. Copies of this booklet, which is Extension Circular 577, dated November 1959, may be requested from the Extension Service, South Dakota State College of Agriculture, Brookings.

Government Publications. "What Consumers Should Know about Food Additives" is the title of an attractive, two-color booklet prepared by the Food and Drug Administration to tell the public about food additives and the new law. A short historical sketch describes some of the early work by Dr. Harvey Wiley in the battle for the original pure food law. Other topics include an explanation of the necessity for public health safeguards of food and how the new law works. Factual information about many of the more important kinds of food additives is also presented. Copies of this booklet may be ordered from the Government Printing Office, Washington 25, D. C., for 15 cents each.

An eighty-four-page, paper bound compilation of charts and background data on the nation's children and youth was prepared by the Interdepartmental Committee on Children and Youth for use in briefing participants in the Golden Anniversary White House Conference on Children and Youth held last month. Titled, *Children in a Changing World*, the book contains seventy charts, each with supplementary text, which are presented under four general headings: "The Changing World," "The Children and Their Problems," "What Is Being Done," and "Implications for the Future." Charts run the gamut of subject matter from the number of students in the labor force through classroom and teacher shortages, causes of mortality in children, new housing related to population growth, to national parks and forests available as recreation areas. Copies of this compendium may be ordered for $1.25 each plus 25 cents shipping charges from: Publications Division, White House Conference on Children and Youth, 330 Independence Ave., S. W., Washington 25, D. C.

From the USDA comes a new report, Home Economics Research Report No. 9, *Factors Influencing the Palatability, Vitamin Content, and Yield of Cooked Beef*, by Elsie H. Dawson, Grace S. Linton, Alice M. Harkin, and Cora Miller. In it are summarized data from a series of studies conducted at several univer-

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Tempting, flavorful tid-bits to tease the appetite. These puffy, crispy crackers, slightly salted on top, are perfect to serve with soups and chowders, chili, oysters and other seafood. Easy, economical to serve—no waste of time, no waste of crackers!

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Savings average about $7,000 a year in serving food, according to Mr. Lane. He estimates that costs would have been $17,000 under his old system with conventional equipment. With paper, only $9,940.70 was spent in 1958. The biggest savings are in dishroom salaries and clean-up. Also, the patients and staff appreciate the lightweight and noiseless qualities of all-paper service.

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PAPER
the personal food service

sities under contract with the U. S. Department of Agriculture. The program was carried out to determine the best home-cooking methods for different cuts of lower grade beef. Meat cooked by dry-heat methods (roasting and broiling) and moist-heat methods (braising on top of the range, in an oven, and in a pressure cooker) was compared as to tenderness, juiciness, and flavor. Palatability scores for tenderness and flavor were higher for dry-heat-cooked meat for each market grade when corresponding cuts of round of beef were cooked by dry- and moist-heat methods to the same degree of doneness. Beef pressure-braised to 176°F. was rated more tender but less juicy and flavorful than oven-braised beef. Enzyme tenderizers did increase the tenderness, but at a possible sacrifice of juiciness and flavor. Vinegar as a tenderizer was considered definitely undesirable. Pounding the meat increased its tenderness slightly. This report presents forty-three tables of data, together with bibliography. Single copies may be ordered from the Government Printing Office, Washington 25, D. C., for 50 cents each.

Standards for Safety of Food Additives. *Principles and Procedures for Evaluating the Safety of Food Additives* has been released by the Food Protection Committee of the Food and Nutrition Board in booklet form. It is a restatement, with amplification of certain aspects of the problem, of a 1954 publication reprinted in 1957, under the title, "Principles and Procedures for Evaluating the Safety of International Chemical Additives in Food." The new statement is divided into six sections: introduction, definitions of terms, general principles, basis of evaluation, scope of investigations, and evaluation. In the appendix is a discussion of insignificant levels of chemical additives in foods, which was first published in the *Food, Drug, Cosmetic Law Journal* in 1958. Single copies of this booklet, which is National Academy of Sciences—National Research Council Publication 750, dated December 1959, are available for free distribution from the National Academy of Sciences, 2101 Constitution Avenue, Washington, D. C.

New Standards for Lamb. On March 1, revised U.S. standards for lamb and mutton went into effect. The new standards reduced the minimum requirements in the Prime and Choice grades, according to the USDA. Thus, a large portion of lambs which previously qualified for Choice grade now will be identified as Prime. Choice grade lambs now consist in large part of lambs which formerly would have been graded Good or sold without a federal grade. In general, lambs in the new Prime and Choice grades should carry less finish, or external fat. Official grades for lambs are: USDA Prime, Choice, Good, Utility, and Cull. Only the higher grades are usually available at retail.

Super-Milk. Milk with added nonfat milk solids was preferred to regular milk by more than two-thirds of the people sampled, according to a test recently conducted by the Minnesota Experiment Station. Milk fortified with varying amounts of nonfat milk solids was tested with nearly a hundred families in St. Paul. Each family received two bottles of milk and was asked to report which, if either, its members preferred. Simpler tests were made with milk vending machines among college students. Preferences ranged from 66 per cent for the fortified milk sold from machines to about 80 per cent among the test families.

Increasing the nonfat solids gives the milk a sweeter taste up to a certain point. The milk in these tests was fortified at several levels, varying in total nonfat solids content from 8.6 to 11.5 per cent in weight. Normally, milk in bulk units varies from around 8.4 to 9.2 per cent total nonfat solids.

Mississippi and Arizona report similar tests.

Army Personnel Announcements. Helen R. Stafford has received an appointment in the regular army in the grade of Captain. Carmen Santos-Espada has been appointed First Lieutenant and assigned to active duty.

PROMOTIONS

Major to Lieutenant Colonel
Katherine E. Manchester
First Lieutenant to Captain
Helen M. Collins
Mildred Duomi
Betty A. Estrada
Mary L. Mudra
Marilyn Schmechel

SEPARATIONS

Lt. Virginia Bartels
Lt. Patricia L. Corley
Lt. Annette C. Ellens
Lt. Anne B. Lewis

News of State Associations

Illinois Dietetic Association. March 3 and 4 were the dates of the spring meeting of the Illinois Dietetic Association in Chicago. The program included:

"Create Ideas—Ideas Create"—Bess Sondel, Ph.D., Professorial Lecturer in Communications, University of Chicago

"A New Look at Diet Therapy"—Louise Mojonnier, Ph.D., Illinois Institute of Technology, Chicago

"A Community Initiates Nutrition Education"—panel discussion

"The Dietitian—Food Supervisor Relationship"—Myrtle Van Horne, A.D.A. Food Service Supervisors' Program Project Director, Chicago

"Listen! Don't Detour Ideas"—Ellen

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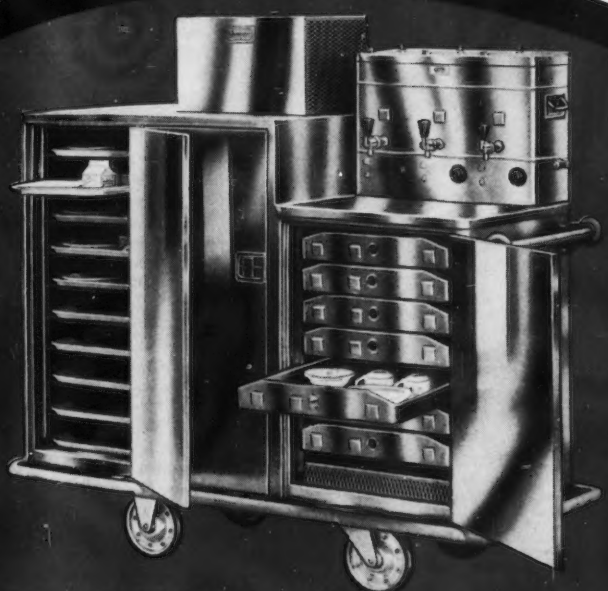

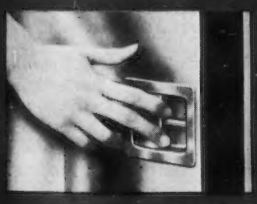

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It pleases patients with "little" things that mean so much: pre-heated coffee cups; choice of beverages and soups (hot or cold); crisp salads; cold desserts . . . to match piping hot meats and vegetables. NO COMPLAINTS ABOUT "INSTITUTIONAL" FOOD!

EFFICIENCY FOR YOU

1. Unobstructed, counter-height set-up area with exclusive "step-down" feature. Takes trays up to 15½"x 20½".

2. Refrigerated tray compartments . . . cold items on trays ready to go. Slides easily removed to clean compartments. 3¾" between slides allows space for ½ PINT MILK CARTONS.

3. Heated drawers (185°) . . . each holds three 9" plates, three 5½" plates with hot foods ready for trays. Room for three cups, too. **Only method that guarantees hot coffee.**

4. Holdover refrigeration system maintains low temperature for two hours without current. **No blowers to dry out and wilt food!**

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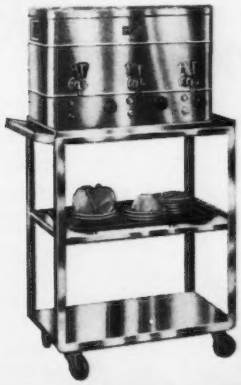
7. REMOVABLE BEVERAGE BAR. Insulated wells for hot and cold drinks and soups. Use separately on utility truck for between-meal servings or in doctors' lounge (see below).



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"Previews of the 1960 White House Conference on Children and Youth" —Naomi Hiett, Executive Director, Illinois Commission on Children, Springfield

"Presenting Your Ideas"—Lorraine Weng, National Dairy Council, Chicago

"Recent Research in Nutritional Interrelationships in Treatment of the Anemias" — Willard Vizek, M.D., University of Chicago Medical School

"How to Plan Your New Dietary Department" — Henriette Gebert, Passavant Hospital, Chicago

Minnesota Dietetic Association. The Minnesota Dietetic Association will meet in conjunction with the Upper Midwest Hospital Conference on May 11 and 12 in Minneapolis. Dietitians from Minnesota, North and South Dakota, Iowa, Montana, and the Canadian province of Manitoba are cordially invited to attend. The program will include:

"Food Service Layout and Equipment"—James Felber, Director of Food Services, University of Minnesota

"New Research with Frozen Foods" —Shirley Trantanella, Department of Horticulture, University of Minnesota

"Report on the White House Conference on Children and Youth"—Mary Reeves, Regional Nutrition Consultant, Children's Bureau, Chicago

"New Findings in Cancer Research" —Dr. Robert K. Ausman, Medical Fellow in Surgery, University of Minnesota Hospitals

"Diet in Cardiac Management"—Dr. Dennis, Director of Cardiac Catherization Laboratory, Ancker Hospital, St. Paul, and Instructor in Medicine, University of Minnesota

"Dietetic Aspects and Research in Nephrosis"—Dr. Robert L. Vernier, Assistant Professor of Pediatrics, University of Minnesota Hospitals

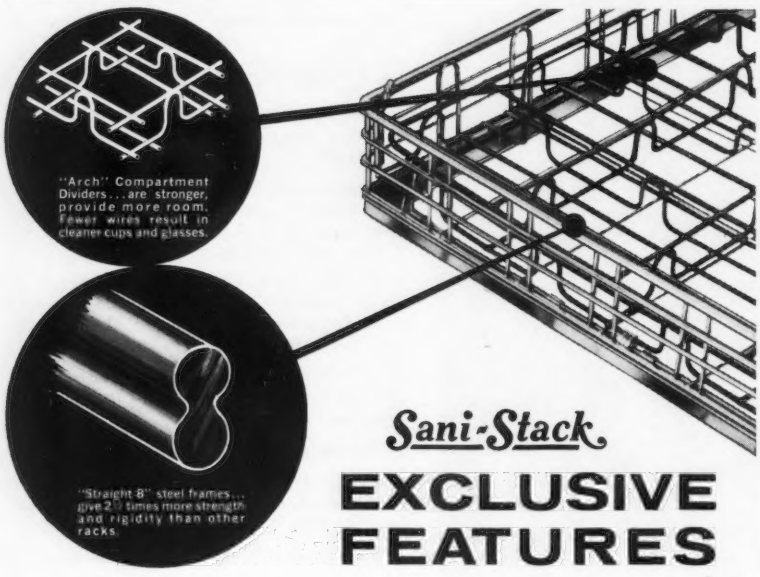
New Jersey Dietetic Association. On March 5, the Food Administration Section of the New Jersey Dietetic Association began a workshop on food costs to be given at four weekly meetings. Instructor for the program is Dr. Neva Henrietta Radell of New York City. Topics covered included: purchasing, storage, production control, daily records, and financial statements, with stress on business policies and procedures and the financial aspects of management.

The New Jersey Dietetic Association presented an exhibit on weight control at a one-day Homemakers' Day program on January 26 in Trenton.

New Mexico Dietetic Association. The Community Nutrition Section of the New Mexico Dietetic Association has prepared a mimeographed bibliography to help libraries throughout the state evaluate their books on nutrition and develop an authoritative collection, free of books which may be of the "faddist" or "quack" variety. This list was sent out with a covering letter, in which the Association offered to review other books not listed.

New York State Dietetic Association. April 20 through 22 have been set as the dates of the thirtieth annual meeting of the New York State Dietetic Association in Syracuse. Field trips will be the feature of the first day. The theme, "Our Heritage—Our Horizons" will be developed during the professional program on the following two days. The opening meeting on April 21 will feature a talk by Dr. Marguerite J. Fisher, "General Education as a Part of Professional Education."

Other presentations will include a panel discussion of "The Heart Patient and Community Resources," and diet therapy and food administration meetings. Dr. Frances Johnston, Cornell University, will discuss "The Controversy Regarding the Calcium Requirement," after which Dr. John McKibbin will talk on "The Present Status of Dietary Fat." Stanley F. Campion will be the first speaker at the food administration meeting, with the topic, "What China Can Do for You?" to be followed by Colin McLean, who will discuss "Interior Decorating in Dietary Departments."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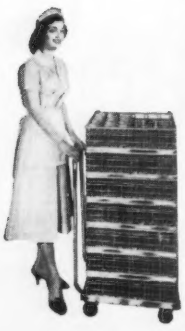

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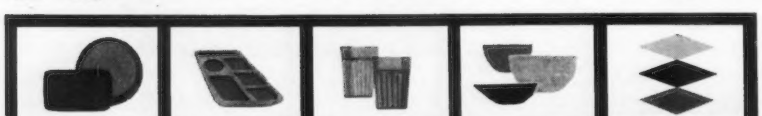

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The final presentation will be by Beatrice Finkelstein, Wright-Patterson Air Force Base, Dayton, Ohio, whose subject will be "Food, Nutrition, and the Space Traveler." Beula Becker Marble will attend the meeting as A.D.A. representative.

In line with the theme of the convention, Mary I. Barber, as guest speaker at the anniversary luncheon, will talk on "Our Heritage."

North Carolina Dietetic Association. A second workshop on "Teaching Nutrition to Practical Nurse Students" was held at The University of North Carolina, Chapel Hill, on January 22. Features of the program were: "Let's Make Our Nutrition Courses Practical" by Helen McLachlan, Associate Director, Department of Dietetics, North Carolina Memorial Hospital, Chapel Hill, and "Your Needs" by Vivian Culver, North Carolina Board of Nurses Registration and Nursing Education.

The eighth annual hospital food service institute to be co-sponsored by the state hospital and dietetic associations and the North Carolina Board of Health will be held April 6 through 8 at North Carolina State College, Raleigh. The program has been planned to help food service supervisors employed in hospitals having twenty beds or more, with particular emphasis on administrative techniques. A demonstration of the use of nonfat dried milk in budget menus, group discussions on planning the diabetic diet, and a presentation on "Quality Food vs. Food Costs" will highlight the three-day meeting. Special consultant for the meeting will be Myrtle B. Van Horne, Project Director, A.D.A. Food Service Supervisors' Program, Chicago.

Virginia Dietetic Association. Dietitians in Virginia have cooperated with the State Department of Health in producing a *Diet Manual for Small Hospitals and Nursing Homes.* The contents include a page devoted to the four-food-group for menu planning; a section on diets, including the regular diet and fourteen types of diets for therapeutic purposes or special groups; and a section on food management and service, including such topics as menu planning, food purchasing, storage, and so on. A bibliography of eleven references is also included. The manual has the approval of the Medical Society of Virginia.

Association Activities

A.D.A. Representatives. Myrtle Van Horne attended as A.D.A. representative the *North Dakota Dietetic Association* annual spring meeting in Grand Forks on March 19.

Evelyn A. Carpenter will serve as A.D.A. representative at the *Ken-*

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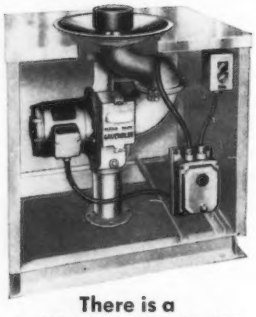

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tucky Dietetic Association's annual meeting, to be held April 7 and 8 in Lexington.

Headquarters Staff. Mrs. Dorothy W. Inyard has resigned from the A.D.A. Headquarters staff as Membership and Credentials Director to accept a position as the dietitian at LaRabida Jackson Park Sanitarium, University of Chicago Clinics. The Executive Board announces the appointment of E. LaVone Bowman as her successor.

Mrs. Inyard has been a member of the Headquarters staff since 1950. She was responsible for the reorganization of the Credentials Service as it is known today and for founding the *Credentials Service Bulletin*. The Membership Department has also been her responsibility since 1954. The Association's Secretaries, under whom Mrs. Inyard has served, have all acknowledged her fine organization and competency.

Miss Bowman, a member of The American Dietetic Association, brings to the position a variety of experience which particularly qualifies her to counsel members about job opportunities and to assist individuals interested in applying for A.D.A. membership.

Miss Bowman holds both a bachelor's and a master's degree from the University of Wisconsin. Her experience includes development of educational materials for the National Dairy Council; Instructor of Nutrition at North Texas State College, Denton; and Laboratory Assistant at the Oscar Mayer Company, Chicago, conducting analysis of meat and meat products. She has also had hospital and institutional foods experience.

Homemaker Service Conference. *Dr. Frances R. Godshall, Temple University, Philadelphia, as A.D.A. representative at The National Health Council Conference on Homemaker Services, held February 14 to 16 in Harriman, New York, reports:*

The emphasis of the meeting was the part the "homemaker" may play in the care of an at-home patient.

Participants in the conference appeared to be concerned with the matter of making certain that simple nutritional instruction be included in the orientation period in all "homemaker" service training programs. It was also agreed that modified diets might be mentioned in the initial training period but that the methods of carrying them out in the home be taught as the case arises.

There were general sessions and small workshops. Ann Magnussen, R.N., American Red Cross, and Dr. Godshall served as co-leaders of the combined nutritional and personal hygiene workshop. Recorders were Mary Egan, an A.D.A. member with the Children's Bureau, Washington, D. C., and Florence Austin, R.N., Hartford Visiting Nurse Society. Among other agencies represented in

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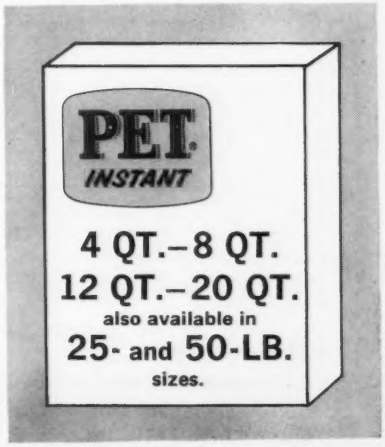

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the nutrition and hygiene group were the American Heart Association, the Jewish Family Service of New York City, the American Nurses Association, the American Cancer Society, the National League for Nursing, U. S. Public Health Service, and National Tuberculosis Association.

The proceedings of the conference will be available on loan from the Lulu G. Graves Memorial Library of the A.D.A. after June 1.

Civil Defense. Lt. Col. Katharine E. Manchester, AMSC, will be the A.D.A. representative at the Women's Civil Defense Council Conference for Region V on April 21 to 22 in Denton, Texas. Col. Manchester is co-representative of Region IV of the A.D.A. Disaster Feeding and Civil Defense Planning Committee.

Workshop on Rehabilitation. "Expanding Services of the Home Economist in Rehabilitation" will be the theme of the workshop being planned by the American Home Economics Association and The American Dietetic Association Joint Committee on Rehabilitation to be held June 25 to 27 in Denver, prior to the annual A.H.E.A. meeting. Ruth A. Reams, Chairman of the A.D.A. representatives on the joint committee, invites all interested persons to attend.

Foods and nutrition is one of the sections of the workshop. "Homemaker service" and "meals-on-wheels" will also be discussed. The hospital dietitian, the public health and extension nutritionists, and all others interested in this field will find the workshop valuable.

A.D.A. Exhibit Program. The Association is in the midst of an extensive exhibit program this winter and spring. The schedule calls for exhibits to be shown at the following meetings:

Chicago Dental Society, Chicago, February 7–10—A. Anne Gabriel, Chairman

National Youthpower Congress, Chicago, February 11–13

Chicagoland Health Fair, Chicago, March 18–27 — Martha Thomason, Chairman

American Academy of General Practice, Philadelphia, March 21–24—Mary Alice Tkach, Chairman

White House Conference on Children and Youth, Washington, D. C., March 27–April 2—Ruth E. Eshleman, Chairman

American Personnel and Guidance Association, Philadelphia, April 11–14—Alice Tkach, Chairman

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Obituaries

Nathalie Mutsue Namba Fisher. The A.D.A. office has received word of the recent death of Nathalie Mutsue Namba Fisher in Hawaii. Mrs. Fisher, who had been a member of the Association since 1951, was until recently on the staff of Graduate Hospital, University of Pennsylvania, Philadelphia. She had also held positions at Pennsylvania Hospital, Philadelphia, and St. Francis Hospital, Honolulu.

Lt. Col. Eleanor L. Mitchell, AMSC. Lt. Col. Eleanor L. Mitchell, AMSC, former Chief of the Army's dietitians and among the first to be commissioned in 1943, died February 12 from injuries received in an automobile accident near Denver. When she retired in 1958, Col. Mitchell had completed more than thirty years of Army service. She was the second Chief, Dietitian Section, and Assistant Chief, Women's Medical Specialist Corps (now Army Medical Specialist Corps) from 1948 to 1952. During this period, she directed the reorganization of food service in Army hospitals, at which time dietitians were given full responsibility for all food service activities in addition to the therapeutic responsibilites which they had previously handled.

Employed by the Army as a civilian dietitian in 1927, Col. Mitchell had served as chief dietitian at many Army hospitals, including Sternberg General Hospital, Manila, Philippines, from 1930 to 1932; Station Hospitals at Ft. Bragg, North Carolina, and Ft. Jay, New York; and Letterman General Hospital, San Francisco. After serving in the Pacific Theater

during World War II, Col. Mitchell spent two years at Army & Navy General Hospital, Hot Springs, Arkansas. Following her tour as Chief Dietitian in the Army Surgeon General's Office, Washington, D. C., she was Chief of Food Service at Walter Reed General Hospital, Washington, D. C. Her last assignment before retiring in 1958 was Chief of the Food Service Division, Fitzsimons General Hospital, Denver. Following her retirement, she had been making her home in Aurora, Colorado. She had held A.D.A. membership since 1933 and life membership since 1944. At the time of her death, Col. Mitchell was engaged in writing part of the history of the Army Medical Specialist Corps.

Dr. Tom Spies. On February 28, Dr. Tom D. Spies, internationally known authority on nutrition, died in New York City. Dr. Spies at the time of his death was Professor and Chairman of Dietetics and Metabolism, Northwestern University School of Medicine, Chicago, and Scientific Director of the Nutrition Clinic, Hillman Hospital, Birmingham, Alabama. Dr. Spies gained fame for his work with pellagra and sprue. In 1957, he received the Distinguished Service Award of the American Medical Association. For his research on pellagra, he had also been awarded the Orden de Carlos Manuel de Cespedes decoration, the highest award of the Cuban government. He was President-Elect of the Southern Medical Association.

Lt. Col. Ruth G. Strain, AMSC. The A.D.A. office has been notified of the death on February 17 of Lt. Col. Ruth G. Strain, Chief of the Food Service Division, Letterman General Hospital, San Francisco. Col. Strain had over fifteen years of Army service, having entered the Army in 1944. During World War II, she served in the European Theater of Operations. Her postwar assignments have included tours as Chief Dietitian, U.S. Army Hospital, West Point, New York; Chief, Food Service Division, Station Hospital, Ft. Bragg, North Carolina; and Chief, Food Service Division, 34th General Hospital, LaChapelle, France. Col. Strain had been an A.D.A. member since 1955.

News of Products and Services

A new 2-gal. container for Wesson Oil has been announced by *Wesson*. Less than half the weight of the 5-gal. container, it was designed for use at the salad bar, grill, and deep fryer, or wherever small quantities of vegetable oil are needed. The container features the Pour-O-Scope spout which permits pouring without waste. The 5-gal. can will continue to be available.

An eight-page folder, in color, "Dairy Foods Complete Your Daily Meals," has been released by the *National Dairy Council* as a visual interpretation of the essential role of dairy foods in meals. Breakfast, lunch, and dinner without milk are shown in pictures with a chart indicating the deficiencies in nine food essentials. The same meals, with milk added, bring the meals up to nutritional standards as determined by the Recommended Dietary Allowances.

A new expendable reach-in, walk-in cooler-freezer combining three separate units in one space-saving cabinet is offered by *Elliott-Williams Co., Inc.* Only about three-fourths the floor space needed for individual units is required. The front compartment, refrigerated to 35°F., is a conventional reach-in, walk-in combination refrigerator reached through a flush walk-in door and three reach-in doors. Large volume walk-in storage is provided for bulk goods; smaller items may be stored on three aluminum shelves convenient to the reach-in doors. A walk-in freezer compartment for bulk storage of frozen foods is reached through the refrigerator section. Unlimited size combinations are offered. The exterior is finished in aluminum alloy, porcelainoid enamel, or stainless steel.

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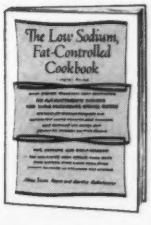

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A forty-eight-page booklet, "Ideas on Ice," describing ice-making machines and how to use them is offered by *Scotsman Ice Machines*, manufacturer of more than sixty models of cubers, flakers, storage bins, crushers, drink dispensers, and coin-operated ice vendors with capacities from 50 lb. to 2 tons daily. More than eighty photographs are included, as well as practical applications shown in helpful-hint and photo-story fashion.

A new line of multi-source protein dinners has been developed by *Beech-Nut Baby Foods'* Research Department. Egg yolk and non-fat dry milk have been added to the line of strained and junior beef, lamb, and chicken dinners.

Borden's Instant Dutch Chocolate Flavored Mix is made with imported Dutch cocoas, fortified with thiamine, riboflavin, vitamin D, and iron. It mixes instantly in hot or cold milk. A new family-size package, weighing 2 lb. 6 oz., is now being distributed, in addition to the 1-lb. size.

A newly designed "square look," door-type automatic dishwashing machine has been introduced by *Insinger Machine Co.* With single, self-draining, seamless and cove-cornered tank, "Commodore 15" will service up to 250 diners per meal.

"The Prune Trumpeter," an illustrated recipe folder, from the *California Prune Advisory Board*, introduces prunes as "more than a fruit." On its six pages are presented some of the ways prunes add flavor to dishes ranging from entrées to desserts, from breakfast through dinner.

Tray rack "shock absorbers" are offered by *Metropolitan Wire Goods Corporation.* Made of plastisol-coated metal, the strips are installed in the rack to prevent the edges of plastic and fiberglass trays from chipping when dropped into the rack. The strips may be applied to racks now in use or obtained installed in new Sani-Stack tray racks.

A pure vegetable product, "Pam Dry Fry," from *Pam Industries, Inc.*, made of lecithin derived from soybeans, may be sprayed on any utensil or surface for cooking, frying, roasting, baking, or broiling. The spraying technique forms a film *on* which foods are cooked by temperature alone. No fat, oil, or shortening is needed, and it is claimed that the natural flavor of foods is not altered. No calories are added to food. The coating helps prevent foods from sticking to the cooking utensil.

Shaker-type salt and pepper packets and sugar packets are available from *Stanley Supply Co.*, with a "repeat" pattern of individual private imprint if desired. They are packaged 1,000 in a cardboard box or 10,000 in a case. The sugar packets are polyethylene-lined and contain 70 or 100 grains sugar. These also are available with private imprint.

The Rath Packing Company suggests encasing strips of crisp fried bacon in pancakes to give new shape and flavor to a well known food. Table tents and menu clip-ons with the theme of bacon-strip pancakes are offered to promote the idea.

Hayden House announces new cooked turkey giblet dressing rolls to be used with Hayden frozen cooked turkey rolls or slices and turkey giblet gravy rolls. The ingredients include turkey giblets, turkey broth, bread cubes, and greens. The frozen dressing roll needs only to be thawed 30 min. before heating 10 to 15 min. Each 2½-lb. roll will provide thirteen to twenty-six servings at a cost of 1¾ to 3¼ cents each. Each roll is packaged in a moisture-proof casing enclosed in a carton, four cartons to a case.

A new line of heavy duty gas pizza ovens, especially designed for stacking, has been introduced by *Bakers Pride Oven Co.* Two 2-in. brick hearths hold sixteen 12-in. or ten 16-in. pizzas which will bake in 4 min. at 625°F.

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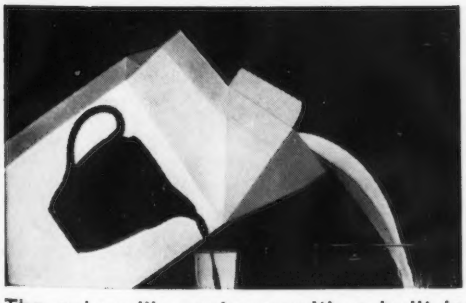

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Bloomfield Industries Inc. is offering a wire rack with space for three silverware holders to permit sorting of dirty silverware at the table. Made of heavy-gauge wire for durability and easy cleaning, the rack clips on to a standard plastic dish box and locks with tension.

Bloomfield salt and pepper shakers have been packaged in an attractive box for over-the-counter sale by food operators. One set, The Town and Country Twosome, is available in chrome or 18-karat gold plated caps. The other set, The Town and Country Threesome includes a sugar dispenser.

Named the "Stack 'N Nest," a practical cover for *Bloomfield* Marlex Tote Boxes is made of reinforced plastic to snap in place over the bead of the tote box to keep foods fresh, sanitary, and clean. The cover is ribbed for strength and rigidity to support stacked weights. With recessed tops, it holds stacked tote boxes securely. Smooth, easy-grip handles and raised edges make it useful as a tray. It is available in gray or tan.

A dual-purpose food carrier introduced by *Sico Manufacturing Co., Inc.*, doubles as a transportable cooler when used with ice. Operating on two 175-watt heating elements drawing 3.4 amps of 110 volt A.C. current, heat is thermostatically controlled and automatically shut off at 170°F., to prevent cooking or dehydrating of food. Heat is conducted through the wall, permitting the use of smooth, sanitary shelves. The carrier was designed to fit all makes of room service tables.

A food service plate cover, "Metalglas" from *Zoia Banquetier Co., Inc.*, made of aluminum or stainless steel, has a thick, shake-resistant Plexiglas top for full visibility, with center finger hole, locked into the metal. The top is indented for stacking purposes. Covers are available from 2½ to 14 in. in diameter.

A new Wet Tray Caddy, model T-222, manufactured by *Caddy Corporation of America* has been designed to permit proper drainage and drying of hot, wet trays, thus preventing unsanitary conditions caused by retained dampness. A sloped top shelf features a drain trough, easily removed for periodic cleaning. Partitions hold the hot, wet trays in an edge position while drying. After drying, they may be transferred to a lower shelf for flat stacking. Construction is of welded stainless steel. The Caddy is equipped with ball-bearing, swivel-type casters and neoprene tires. Over-all dimensions are 32 by 22 by 42 in.

A new 60-qt. mixer introduced by *Toledo Scale Corporation* is powered by a 1-h.p. motor, has four-speed transmission with all controls conveniently grouped. The mixer will accommodate 40-qt. bowls without adapters and 30-qt. bowls with adapters. A floodlight above the bowl provides full visibility. A wide choice of beaters, whips, accessories, and attachments is available. An auxiliary power socket is provided for attachments, and the unit has an overload protection button. Model TM-60 is manually operated, and Model TM-60PT has a fully enclosed power bowl elevator and a timer for automatic shut-off.

Two new china patterns in the "Hospitality" group have been introduced by *Syracuse China Corporation.* "Kingswood," has a leaf border in golden brown and shades of green. It is available either on the Essex shape with an unbroken line from rim to center, or the Winthrop shape with its raised rim. The second pattern, Delmar, is available on Trend, the basic square shape. The corner design is a stylized leaf spray in brown and turquoise, with an accent of red berries. Syracuse also offers "Roxbury," a floral print, in crimson hue with the Econo-Rim shape. The service is extra sturdy, with space-saving dimensions which make it suitable for institutional or tray service. All Syracuse China has the design under glaze, which will not fade or wash off, cannot be scratched or marred by table knives, and is also resistant to chipping and breaking.

History of The American Dietetic Association

1917-1959

Mary I. Barber, Editor

This is the first official history of the ADA from its inception in 1917 through 1959. More than being merely a record of the Association, its origin, structure, aims and accomplishments, this new book includes the many personalities that represent its leadership and explores the role of the dietitian from ancient times to the Space Age.

Chapter 1 considers the term "dietitian" historically, and presents a definition which describes the dietitian's responsibilities today. Chapter 2 outlines the history of dietetics from the ancient Ebers papyrus to the present, highlighting the achievements of great figures in the history of nutrition.

Chapter 3 gives an interesting account of the founding of the ADA. Chapters 4 through 7 record by decades the spectacular advances both of the ADA and of the science in general. Chapters 8 through 14 describe the structure of the Association, and the work of the various Committees and Sections devoted to education, community nutrition, diet therapy, etc.

Chapters 15 through 19 cover the history of dietitians in military and government service, the United States Children's Bureau and the role of the Journal of the ADA and the Association's Public Relations Department. Chapter 20 relates the challenging aspects of dietetics in the Space Age.

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